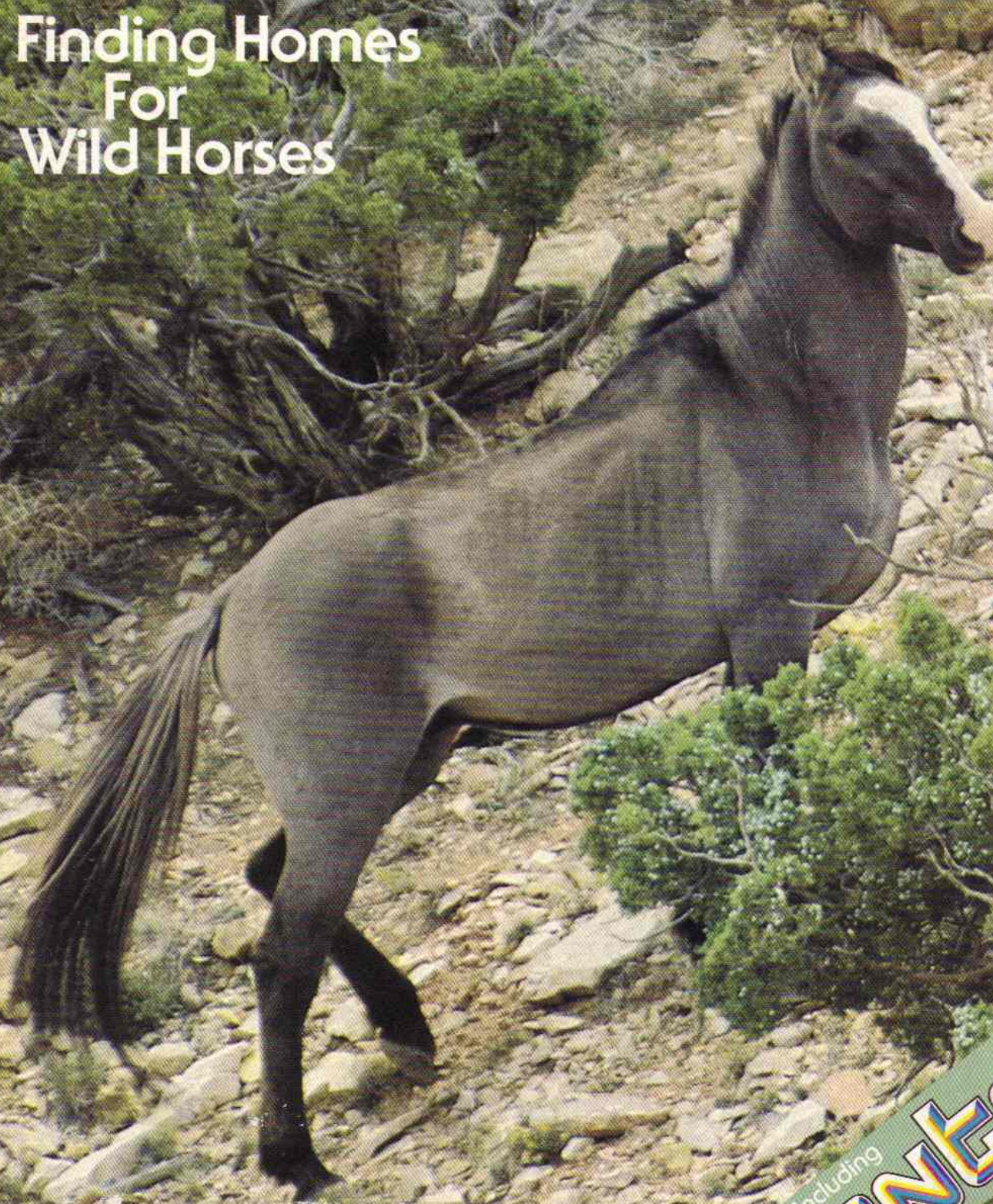
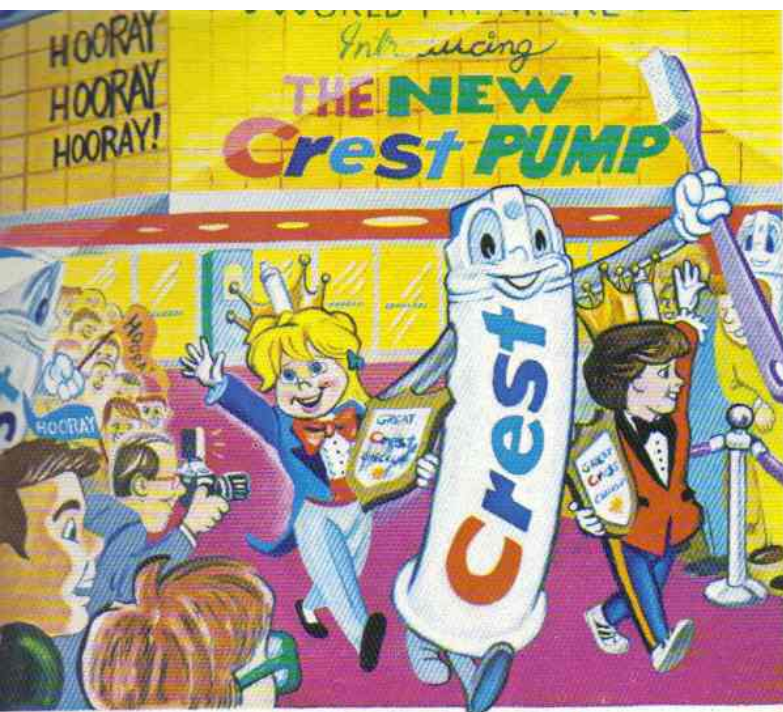


3·2·1·Contact[®]

Finding Homes For Wild Horses



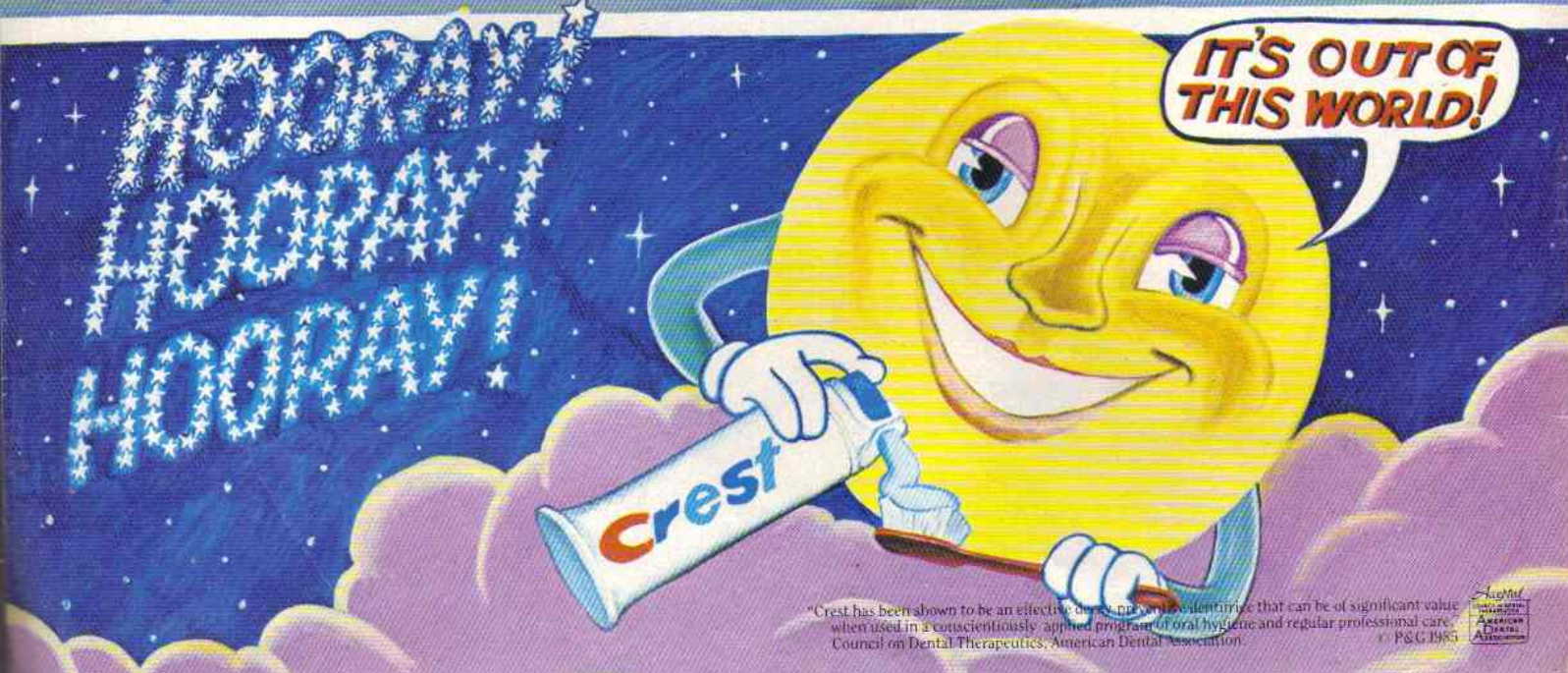
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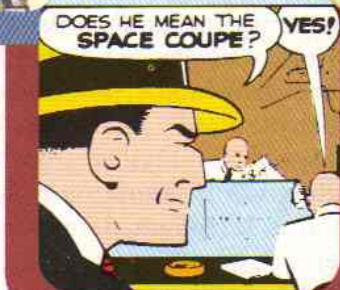


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On our cover: A wild mustang pho-
tographed in Montana.

Cover: Animals Animals © Alfred B. Thomas



Sounds Fishy

Today, it's Sting or Springsteen, but tomorrow you may be listening to fish music on your favorite radio station.

Certain kinds of fish that live in the rivers and lakes of Africa and South America send out waves of electricity as they swim. The electricity seems to work like radar, helping the fish "see" where they're going.

Scientists can study fish electricity by turning it into sound waves. (Radios work the same way.) Mark Ferguson, who works at an aquarium in California, heard fish sounds in another scientist's lab. Mark liked what he heard. So he started mixing sounds to make music.

Mark says that no two fish sound the same. One kind sounds like a violin. Another sounds like a helicopter. One makes a noise like a bunch of marbles knocking together. Bigger fish make louder sounds. But all are music to Mark's ears.

Other people agree. Mark has given several fish music concerts, and he's sold a fish-song tape to an art gallery.

Coming soon—Ringo Starfish?

ILLUSTRATION BY RON LIPKING

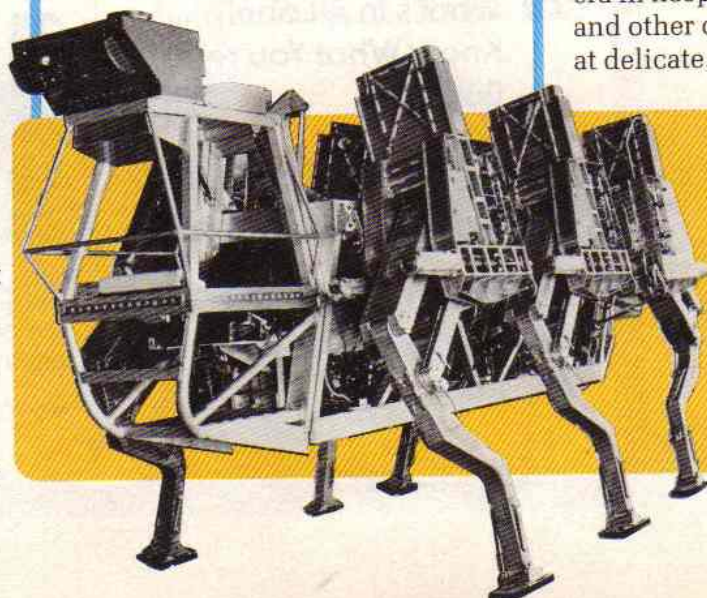
Walking Tall

You're hiking in the countryside. Suddenly, a huge walking tank comes lumbering toward you—just like the ones that attacked Han Solo in *Return of the Jedi*. Well, it may not be your imagination. Scientists have begun building giant walkers to go where wheels can't—over hills, through swamps, and across rocky ground.

One 10-foot tall bug, built in Ohio, has 16 computers for brains. It trudges along on six legs, powered by a beefed-up motorcycle engine. With a top speed of eight miles an hour, this mechanical monster may not be fast or graceful, but there's no better way to ride through a marsh.

Workers in England ride a walker with three legs to scoop soil from river bottoms. This contraption doesn't only walk. It floats, ducks and crawls. If anything gets in its way, it can climb up the river bank, ramble around the obstacle and wade back into the water.

If walking machines are already here, can droids be far behind?



No, it's not *Attack of the Alien Insects*—it's a 10-foot-tall experimental walking machine. The driver sits in the big cage up front.

PHOTO: NEW YORK TIMES PHOTO SERVICE

Eye See TV

"You're out!" cries the umpire. "The ump's crazy!" yells the baseball fan.

Maybe. Or maybe things look different down on the field. Now the whole world can see a ball game from the umpire's point of view, thanks to a tiny video camera developed by ABC-TV.

The new camera is about the size of a golf ball. It only weighs four ounces. It's small enough to attach to an umpire's mask. Still, it sends out pictures good enough to broadcast on TV. A wire connects the camera to a power pack and transmitter that are worn on a belt.

So far, the camera has only been used to broadcast baseball games, starting with last year's Little League World Series. "It really gives the viewer the incredible sensation of the speed of the ball," says Dennis Lewin of ABC-TV Sports.

More uses are on the way. The camera isn't tough enough to use on a football field, but it may bring TV-watchers into the driver's seat at auto races.

It may even help save lives. Surgeons may use the new camera in hospitals to give students and other doctors a close-up look at delicate, difficult operations.



PHOTO COURTESY OF BIGHORN RESEARCH INSTITUTE

Home on the Range

Three years ago, D-Day was a sick little bighorn sheep. Like most of the baby bighorns in California's Santa Rosa Mountains, he was dying of pneumonia—a lung illness. Pneumonia is the latest in a series of problems that have cut North America's bighorn population from 2,000,000 to only 40,000.

So scientists at California's Bighorn Research Institute decided they'd try something no one had ever done before. They flew D-Day to civilization. Back at the Institute, they treated him with antibiotics—medicine that fights against viruses. Today, he's back in the wild again—and a 200-pound father of four.

"D-Day made a remarkable recovery," says the Institute's Jim DeForge.

But the news is even better than that. Seventeen other bighorns have been cured at the Institute. With each sheep they help, doctors come closer to stopping the disease that's threatening all the bighorns.

As for D-Day, he's now one of about 25 bighorn sheep with special radio collars that help scientists keep track of them. And the latest news is—he's doing just fine.

Fasten Your Spacebelts

Imagine driving to your nearest airport, getting on a plane and flying into space!

Scientists at NASA—the U.S. space agency—are working on new space "trucks" to carry people and cargo to the first orbiting space station. (It's scheduled to open by 1992.) The "trucks" will be more like airplanes than rocket ships. They'll be able to take off from a regular airport and blast through Earth's atmosphere. The craft will carry up to 2,000,000 pounds of cargo.

The secret is a new type of motor—a cross between a jet engine and a rocket—that will reach speeds of 17,000 miles an hour. That's 30 times faster than a jet.

Two models are being planned—one as large as a 747 jumbo jet, and one twice that large. Both will be bigger, but handier, than the present space shuttle.

The new space planes may help Earth travelers as well as astronauts. Because they'll fly so fast, airlines may one day use them on extra-long-distance routes. Without even reaching full speed, they'll be able to whisk passengers from New York to Los Angeles in only 12 minutes.

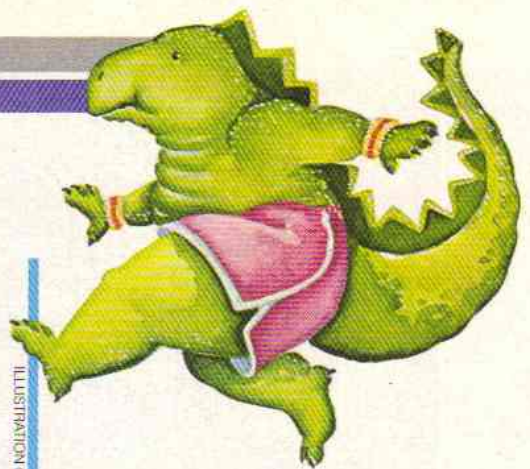


ILLUSTRATION © PAT CLIMANOS

Doing the Dino Hop

You've heard of dinosaurs that walked on two legs and dinosaurs that walked on four. You've heard about dinosaurs flying, running, and wading in deep lagoons. But can you imagine a dinosaur hopping like a kangaroo?

Scientists can figure out how dinosaurs moved by studying their footprints. Most dinosaur footprints are staggered—left, right, left, right—like human footprints in sand. That shows that they walked normally, whether on two legs or on four.

But what if dino footprints came in pairs—with each left print next to a right print? How would the dino have moved?

Pairs of prints just like that were recently discovered in France. The conclusion? Hopping dinosaurs! With pairs of prints as far as seven feet from each other, the new discovery may set the dinosaur world record for standing broad jump.

So What's New?

You tell us and you'll get a nifty CONTACT T-shirt—if we print your story. Send us any science stories that have to do with the future. (Be sure to tell us where you heard the story.)

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ILLUSTRATION BY APRIL STEWART

Home From the Range

TAMING A WILD HORSE



Meet
Sunshine

by Michael Dayton

David Fishel will never forget the morning when Sunshine arrived at his Lewisberry, Pennsylvania home. Sunshine is a wild horse that Mr. and Mrs. Fishel and their four kids adopted as part of a U.S. government program called Adopt-A-Horse.

"I was giving Sunshine her grain when she turned on me," Mr. Fishel recalls. "I knew she was trying to kick me. But I never gave her the chance. I ran around the stall and backed out of there—fast!"

Mr. Fishel had a right to be nervous—and so did Sunshine. She had not been around people much. Born in the Great Rye Patch, Nevada, Sunshine roamed freely through the desert until she was rounded up by cowboys working for the U.S. government. She was shipped to Pennsylvania and adopted by the Fishel family.

Most people think wild horses are a thing of the past, like ghost towns and wagon trains. But there are thousands of wild horses still at home on the ranges of the southwest and western U.S. There are so many, in fact, that they are a threat to other wild animals. That's why each spring, the U.S. government rounds up horses like Sun-

shine and gives them away under their Adopt-A-Horse Program.

The wild horses can be traced back hundreds of years. Spanish explorers probably brought the animals to the U.S. The explorers left the animals here. The horses formed herds which grew in number.

In recent years, the wild herds came dangerously close to dying out. Cattle ranchers and cowboys known as "mustangers" trapped and killed them for grazing on their lands.

Horse Protection

The U.S. Congress passed laws in 1971 to protect the remaining horses. The laws have worked very well. Under U.S. protection, the number of wild horses rose from 17,000 in 1971 to about 62,000 last year.

The growing number of horses is a danger to other wild animals. "The horses compete with other animals such as antelope and sheep," Terry Lewis told CONTACT. Mr. Lewis is an official with the Bureau of Land Management, the U.S. agency that deals with wild horses.

"With so many horses out there," Mr. Lewis



Sunshine started off on a diet of hay. Then the Fishels began to feed her better-quality grains.



Sunshine takes Janelle for a ride as her father walks alongside.

continues, "food can get pretty scarce."

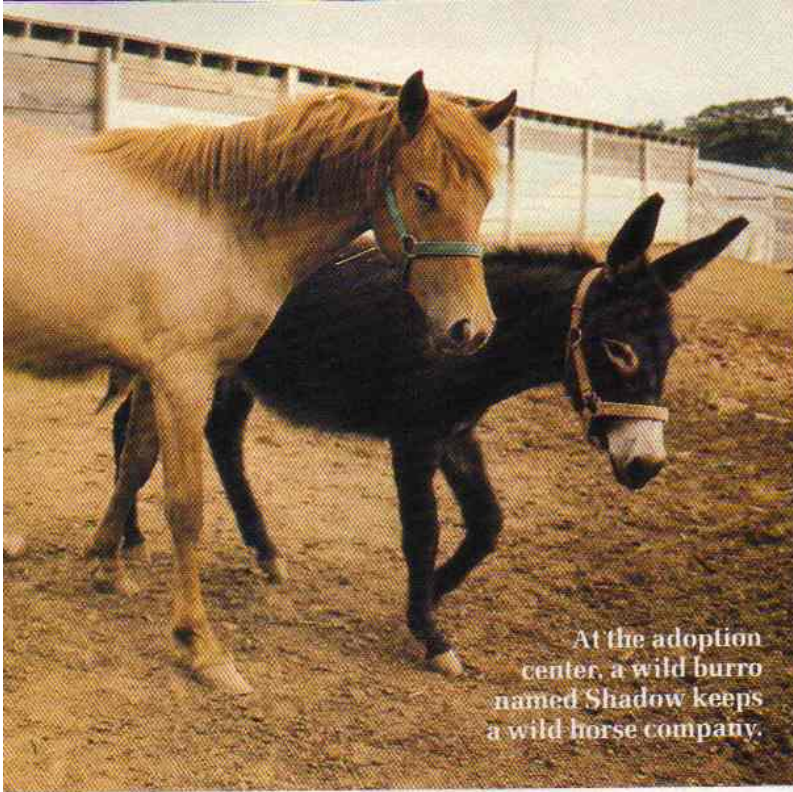
The large herds may also endanger the environment—especially rivers and streams. "The horses sometimes overeat the shrubs and grasses that grow in the western states," Mr. Lewis notes. "As a result, the earth is loosened and washes away in the rain. When the soil washes into streams and rivers, the water becomes unfit for humans to use."

When government officials find evidence of overeating, they remove horses from the area. Usually, cowboys rope the animals with lassoes. Sometimes they use helicopters to chase the herd into newly-built corrals.

Once they are rounded up, a veterinarian—an animal doctor—checks each animal's health and age. Then a "freeze mark" is branded on each horse's neck. The mark tells the age of the horse.

From the corrals, the horses are trucked to Adopt-A-Horse centers around the U.S. There they may be adopted by anyone who meets several requirements: The family must have enough land for the horse to live on, and the family must be willing to pay moving costs from the horse center to the adopter's home. ➡

PHOTOS BY RICHARD HUTCHINGS



At the adoption center, a wild burro named Shadow keeps a wild horse company.

Training Sunshine

The Fishels first saw Sunshine in the spring of 1983 at the adoption center near their home in Lewisberry, PA.

For the Fishels, it was love at first sight. "She was scraggly with her winter coat," says Mr. Fishel. "Some horses were really wild, kicking and bucking. But Sunshine was in a stall, standing perfectly still and eating hay. When the kids went to look at her, she came right up to them."

When Sunshine arrived at the Fishels' home, she was shy of people. So the family put a radio in her stall to get her used to human voices.

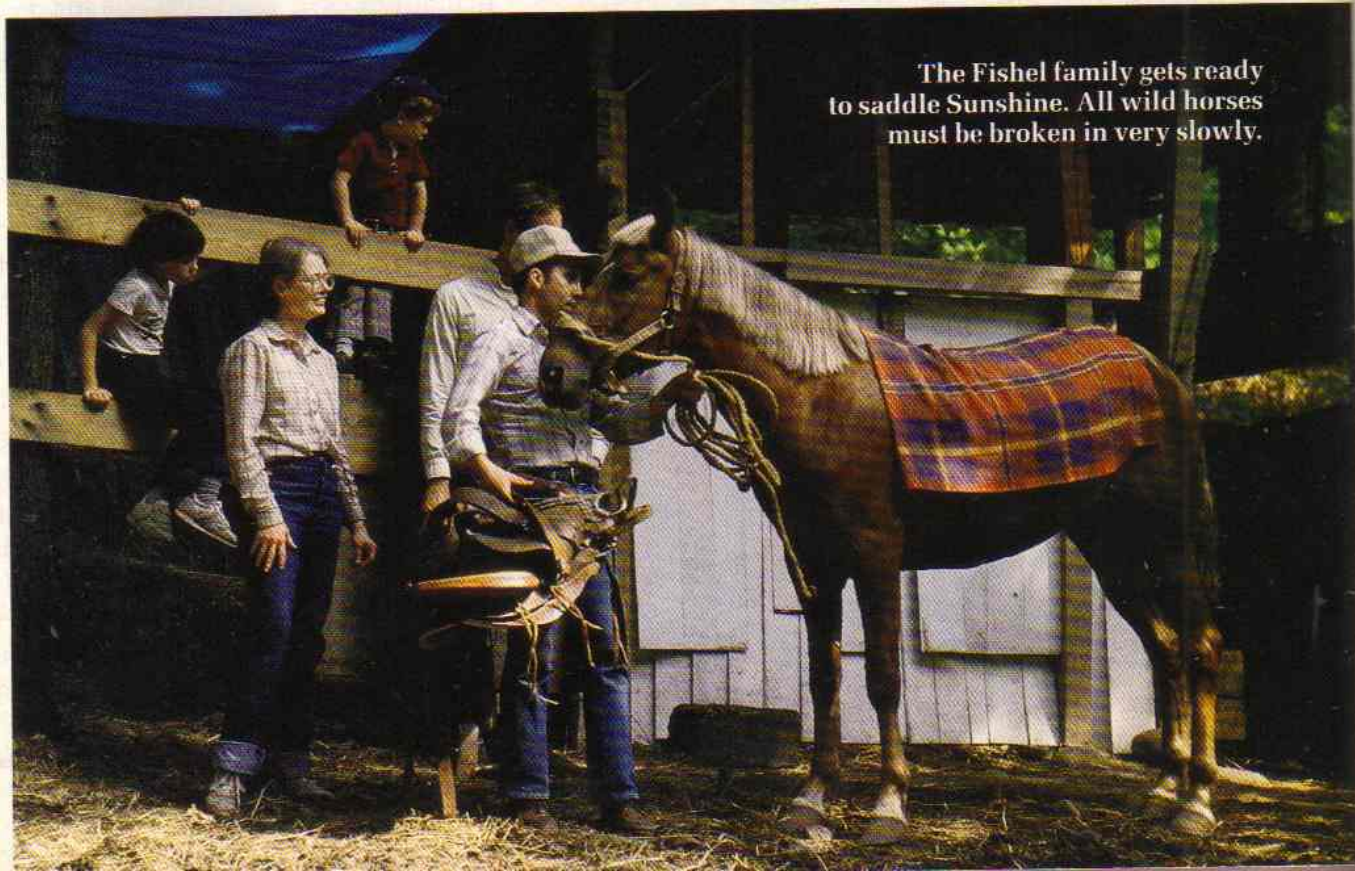
The Fishels soon discovered that Sunshine had one habit that could be dangerous to humans: She liked to rear up on her hind legs. "We tried to break her of the habit, but nothing seemed to work," Mr. Fishel remembers. "Finally she cured herself when she reared up one time and fell over on her back. She was okay, but she hasn't reared up since."

A Horse of a Different Color

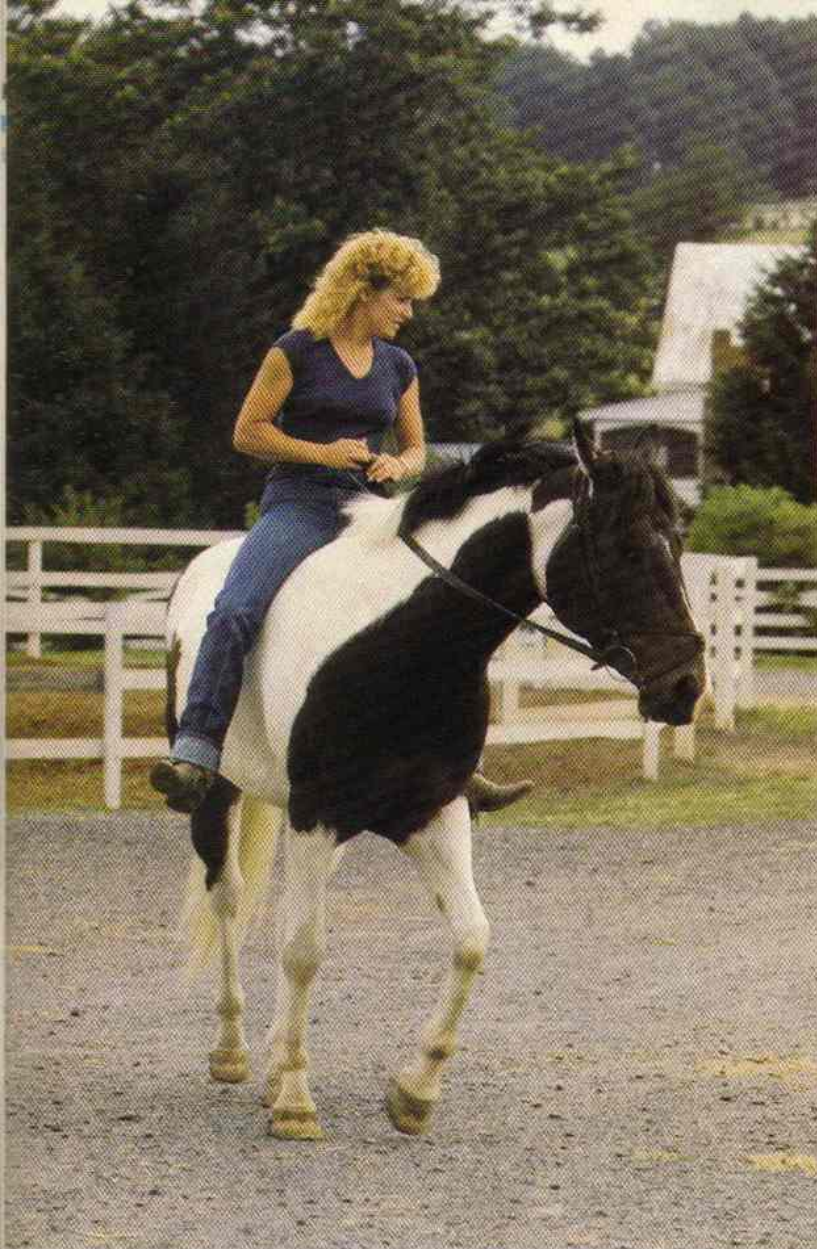
Sunshine looks slightly different from a tame horse. Wild horses have to survive in the harsh desert environment. Because food is so often scarce, wild horses tend to be smaller than domestic horses. Most grow no larger than ponies.

Over the years, wild horses have developed strong feet and legs. Life on the run has toughened their hooves so much that many never need horseshoes. Their coats grow extra-thick because of the long winters they live through.

There is another difference between tame and wild horses that the Fishels had to remember: food. Wild horses feed on such a poor diet that good oats and corn make them sick. So the Fishels started Sunshine on a diet of poor-quality hay and slowly introduced her to better grains. "I found out Sunshine liked sweets when



The Fishel family gets ready to saddle Sunshine. All wild horses must be broken in very slowly.



one day she took some peanut brittle from me," says nine-year-old Janelle Fishel.

And Sunshine soon discovered another treat: a daily brushing. Janelle and her sister Laura, 12, brushed out Sunshine's long winter coat. But she never stayed groomed for long. "Everytime we brushed her, she went out and rolled in the mud," laughs Laura.


To get Sunshine used to a rider, the Fishels first put a halter on her and walked her around the corral. Later they tied a blanket to her back and added sandbags to imitate the weight of a rider. Now the Fishels can ride her through the thick woods behind their house.

Today, Sunshine seems perfectly used to her life in the East. But the Fishels have reason to believe that she hasn't forgotten about her days on the wide-open spaces. Her latest trick? She can open the gate to her stall! But so far, she hasn't galloped into the sunset and back to her first home—the desert of Nevada.

Where to Write

If your family would like more information about adopting a wild horse, write to:

Adopt-A-Horse Program
Bureau of Land Management
350 South Pickett Street
Alexandria, VA 22304

Remember, you must have room to keep a horse, a parent must agree to it, and you must prove you can care for your new pet. 

PHOTOS BY RICHARD HUTCHINGS

Above: Michele Ritter, who works at the adoption center in Lewisberry, PA, takes a pinto named Cherokee Lady for a ride.

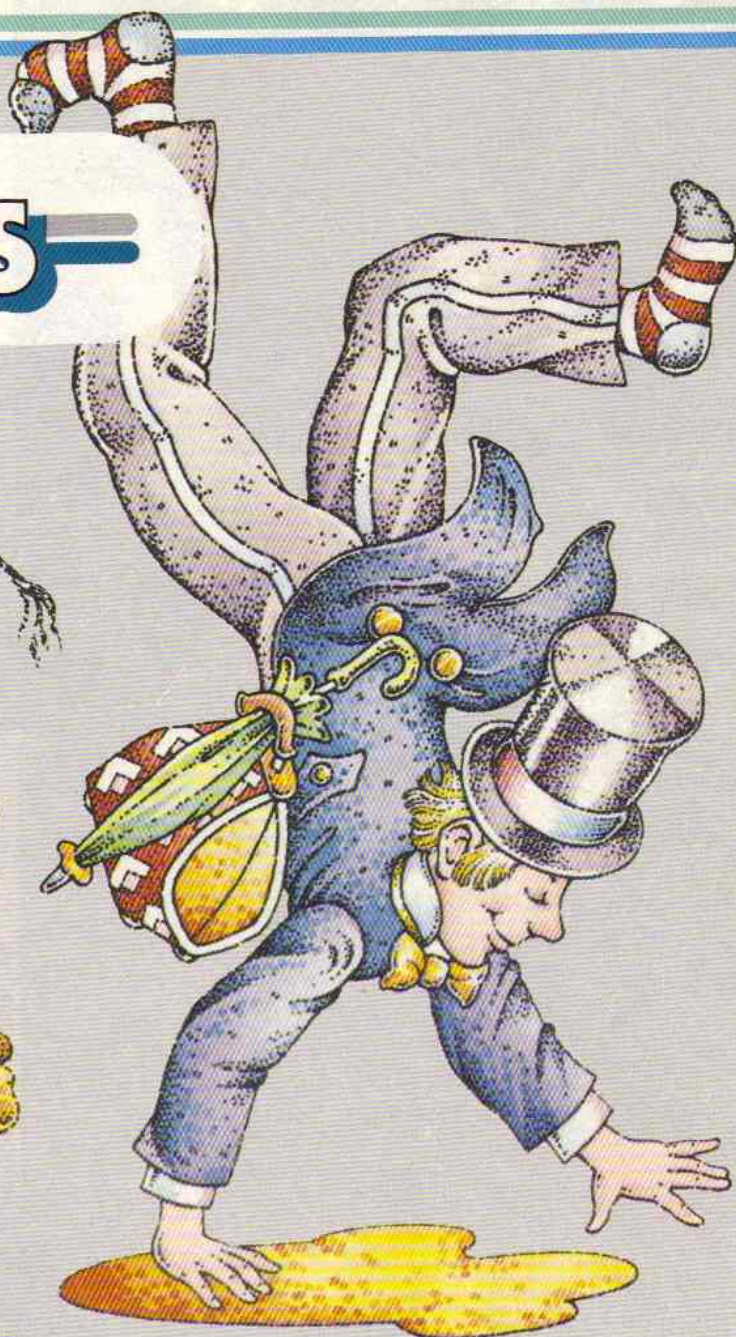
Right: Two wild horses get to know one another as they wait to be adopted.



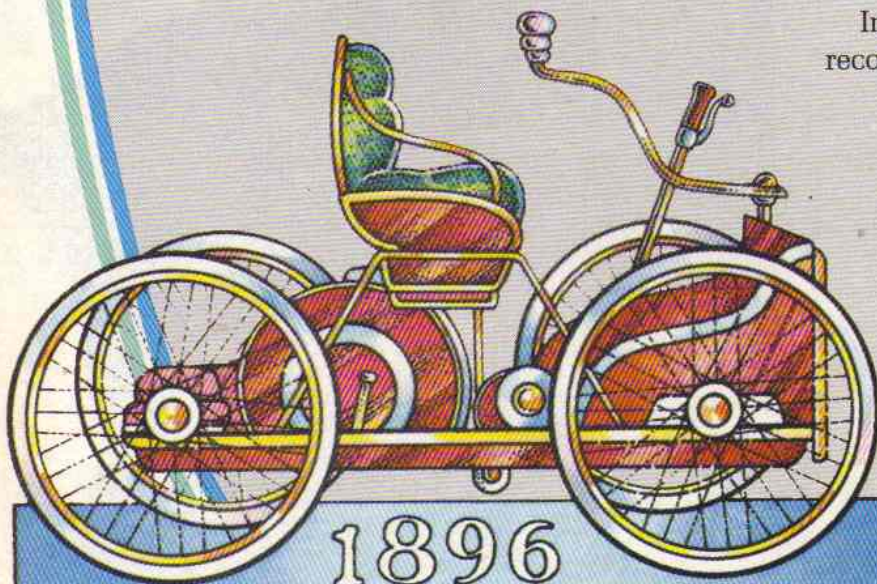
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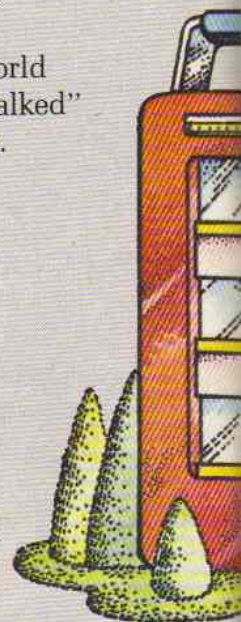
Paint, made from plants and clay, was first used by cave people over 20,000 years ago.

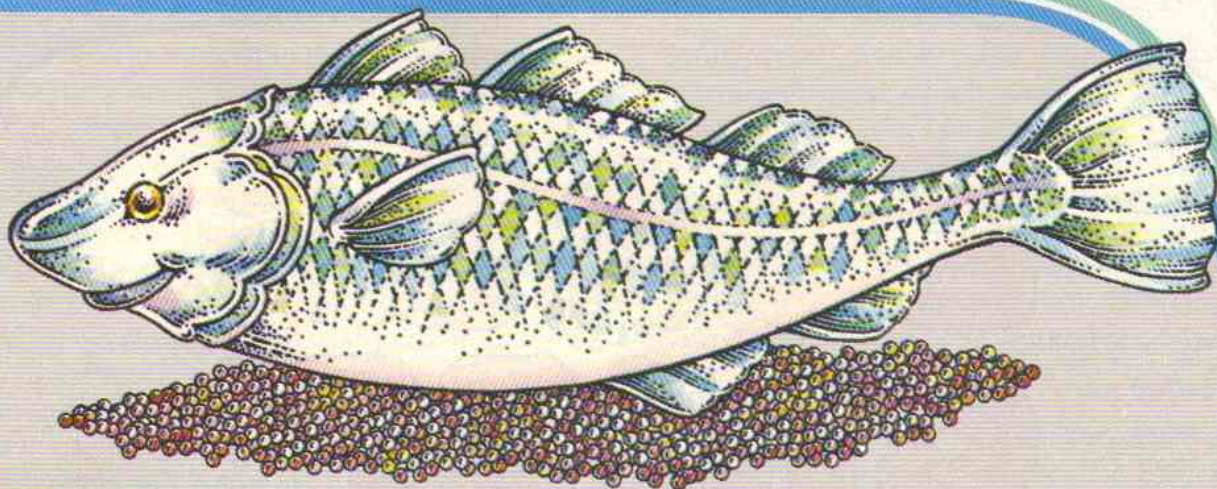


In 1900, Johann Hurlinger set a world record for walking-on-hands. He "walked" 871 miles from Vienna to Paris.

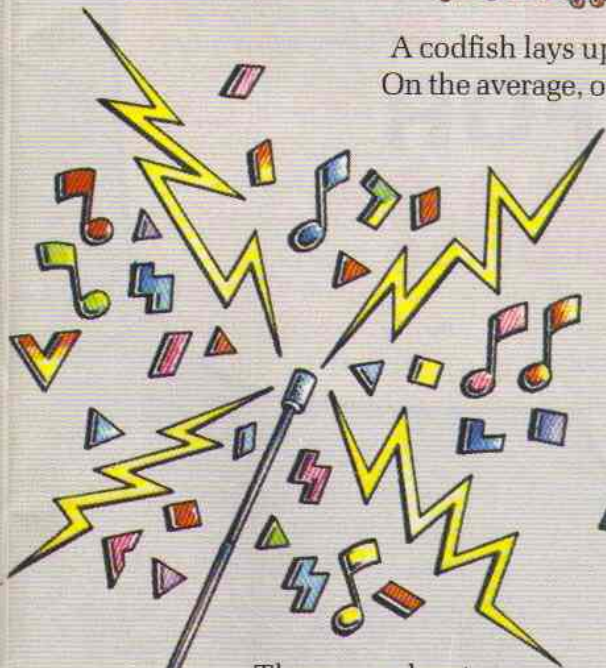


The first car, built by Henry Ford in 1896, had no brakes and couldn't go backward.

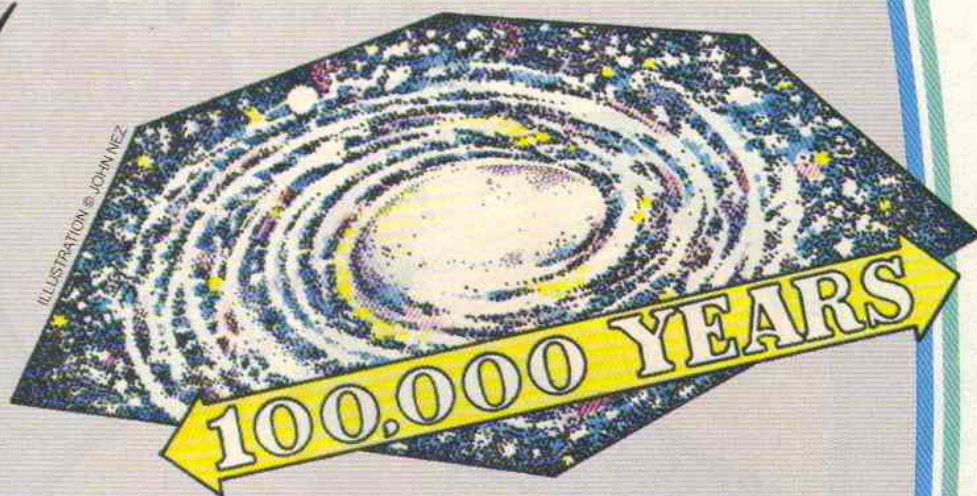




A codfish lays up to four million eggs at one time.
On the average, only two of these will become fish.



There are about
10,000 radio stations
in the United States.



The Milky Way is so huge that it takes
light 100,000 years to travel across it.

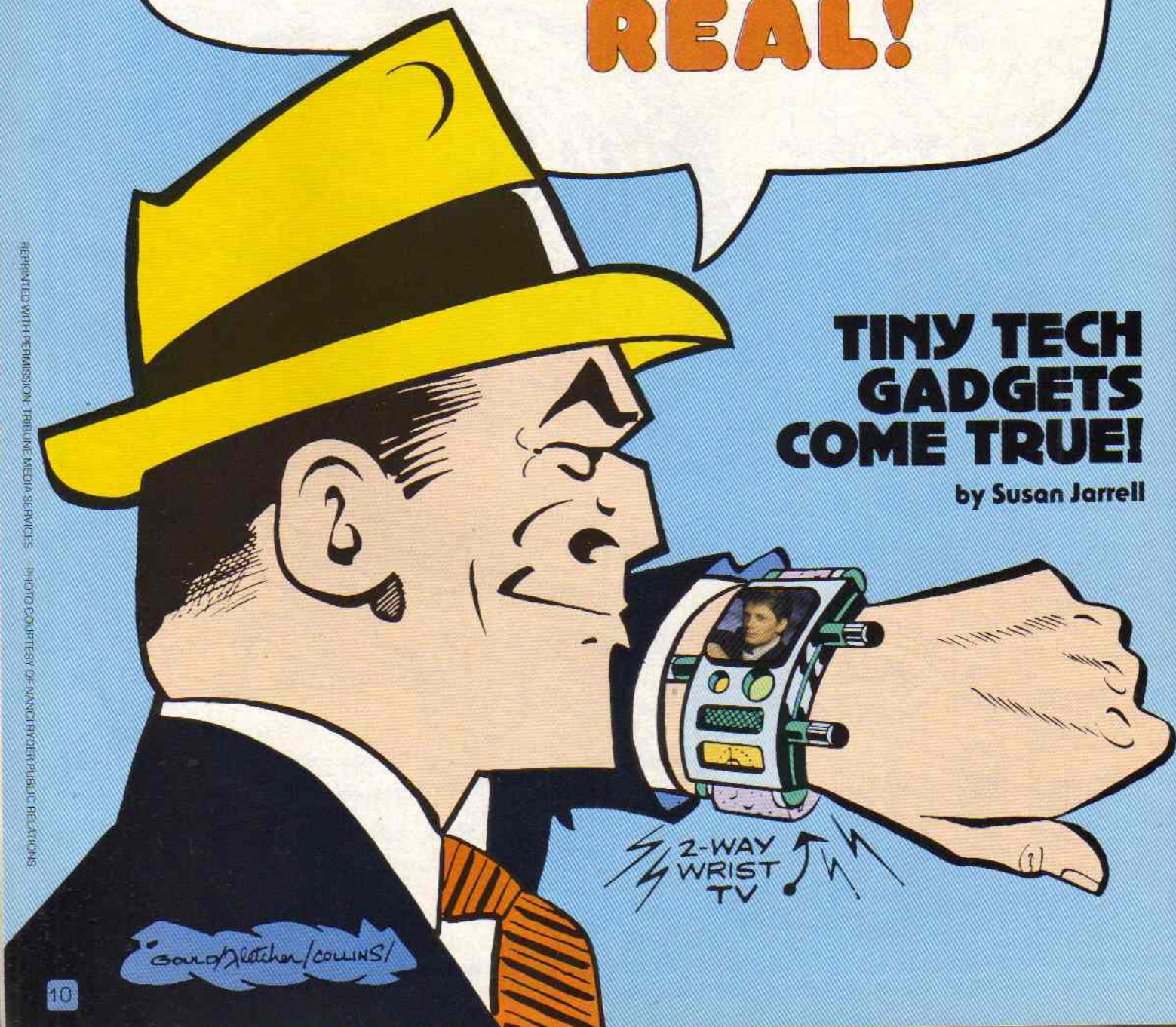


Oil from sunflower seeds is used to
make margarine, paint and soap.

**EGADS,
CHIEF!**
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**TINY TECH
GADGETS
COME TRUE!**

by Susan Jarrell



Comic/Slacker/COLLINS

"All's clear with Operation Street Sweep," Dick Tracy says. "But I'll let you see for yourself, Chief." Tracy points his watch toward the quiet scene. Back at headquarters, the police chief watches on his giant screen.

For 40 years, Dick Tracy, that square-nosed comic strip detective, was the only man in the world with a high-tech wristwatch. Tracy's wrist gadgets were only found in the comics.

Now, thanks to amazing advances in micro-technology (the technology of making items small), real high-tech watches are now being sold. Some talk. Some are tiny radios or TVs. Some warn you if you're getting a sunburn. And some even work as small computer terminals. It's a line-up that would even amaze Dick Tracy.

The arrival of the microchip has made this fantasy real. Companies have created information centers that you can carry on your wrist.

Some of these wristwatch items are nothing more than electronic contraptions or great conversation pieces. Others, however, open up the possibility of two-way communication, computing power, and even weather forecasting on your wrist.

How They Work

How do these new wristwatches talk, play music, show TV programs, or serve as computer terminals? It's all in the wrist, where science has made electronics smaller than ever.

Watches that "speak" use a voice synthesis microchip. These same chips are also found in talking computers, clocks, calculators, bathroom scales, telephone answering machines and robots.

Small televisions and wrist computers use a

liquid crystal display (LCD). Liquid crystal is a special substance which is sandwiched between two pieces of glass. The crystals act like window blinds, letting light in when open and keeping it out when closed. The combination of light and dark crystals create the on-screen picture.

All this high-tech stuff sounds great, doesn't it? Well, it is. Unfortunately, not all the problems with tiny-tech have been worked out—yet.

Tiny-Tech Fingers?

For instance, wrist computers can feel quite bulky when strapped to your wrist. And, in many cases, manufacturers must let them remain bulky. The technology may get smaller, but if control buttons are too small for your fingers to use, the wrist computer will be useless. (Unless, of course, someone comes up with tiny-tech fingers!)

And so far, the kinks haven't quite been worked out of tiny TVs. The picture is often smudged, so viewers can't see clearly.

All this small talk is great. But what about Dick Tracy's two-way wrist radios and TVs? Will we soon be able to call home simply by talking into our watch? Experts say this could still be a long time coming. So far, no one has yet been able to make a watch with enough power to make two-way communication possible.

But don't give up hope. Companies are working hard on this problem. In a few years, you may be talking into your wristwatch as you walk down the street. And the most amazing thing: Your watch will be talking back!

In the meantime, turn the page to find out what's available now in the world of high-tech, tiny-tech stuff. ◀▶



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Tiny Tech Round-Up

What's Your Number?

This tiny-tech marvel from Casio can keep track of up to 50 telephone numbers. In addition, you can set five daily alarms, and use its stopwatch. You can also program it to give you any day of the year until 2019.



PHOTO COURTESY OF CASIO

Tiny TV

If you've always dreamed of having a TV star in the palm of your hand, you're in luck. This black and white hand-held television comes from Sony. It's called the Watchman. The pocket-sized TV comes with an AM/FM radio and headset.



PHOTO COURTESY OF SONY CORP.

Look Out Below!

Citizen Watch Company of America brings you "Aqualand." It's the world's first combination diver's watch and depth sensor. It works down to 260 feet.



COURTESY OF CITIZEN WATCH CO. OF AMERICA

Pocket Magic

This Seiko Pocket Color Television features a two-inch pop-up screen. It weighs less than one pound and runs on four batteries. Its overall size: 5.8 inches by 1.1 inch.



PHOTO COURTESY OF SEIKO

Data Date

Seiko's Datagraph 2001 works with all Apple II-series computers. It has 2K RAM storage which can organize your day and help you keep schedules and records.



PHOTO COURTESY OF SEIKO

Watch It!

This Seiko computer wrist terminal hooks into Apple, IBM and Commodore computers. It does the usual computing and it also keeps track of phone numbers. The wrist terminal can also monitor the calories you eat, and if you're a runner—time and distance records.

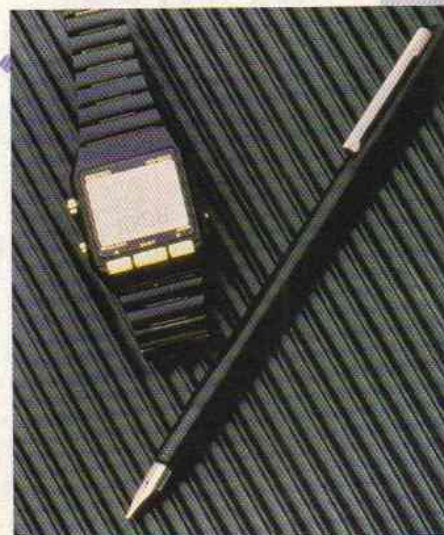


PHOTO COURTESY OF SEIKO

Hot Item

This handy-dandy watch from Citizen gives you the day, date and the temperature. It also has a stopwatch and an alarm clock.



COURTESY OF CITIZEN WATCH CO. OF AMERICA

Having
A Wonderful
Time

In Our
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Any Questions?

What is recycled paper?

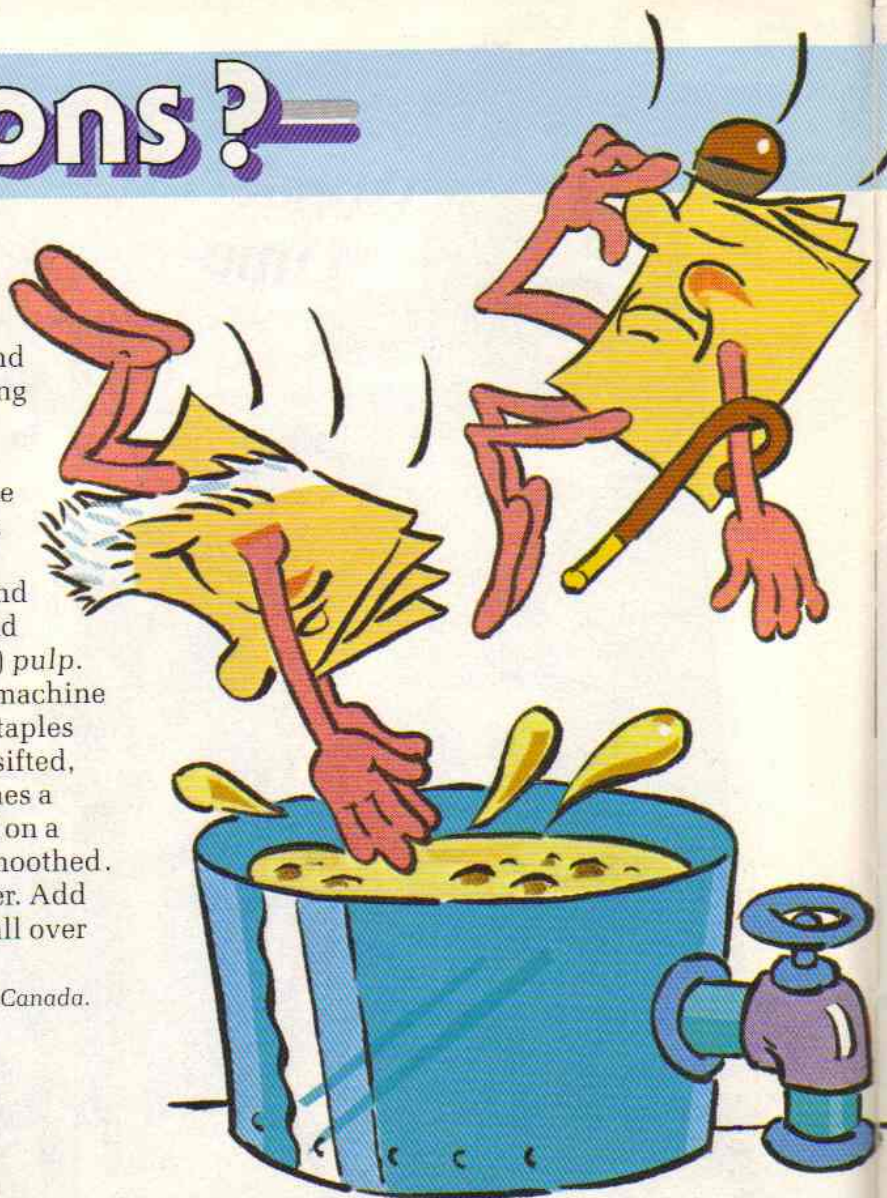
Recycled paper is old paper that's been ground up and made into paper again. So, by recycling paper, people save trees. They also control pollution.

Paper recycling starts when old papers, like newspapers, are brought to a recycling plant. Then the papers are dumped into a large vat called a *pulper*. The pulper contains water and chemicals that remove ink from the paper and turn it into soft, wet mush called (what else?) *pulp*.

Next, the pulp travels from the pulper to a machine that removes anything that isn't paper, like staples and paper clips. Then the pulp is squeezed, sifted, cleaned and mixed with water until it becomes a thick, white paste. This thick paste is spread on a sheet of metal. It is heated, dried and then smoothed.

The paste dries into crisp, clean, new paper. Add some ink and what do you get? Newspaper, all over again.

Question sent in by Gareth Lambkin, Hinto, Alberta, Canada.



Why do we get wax in our ears?

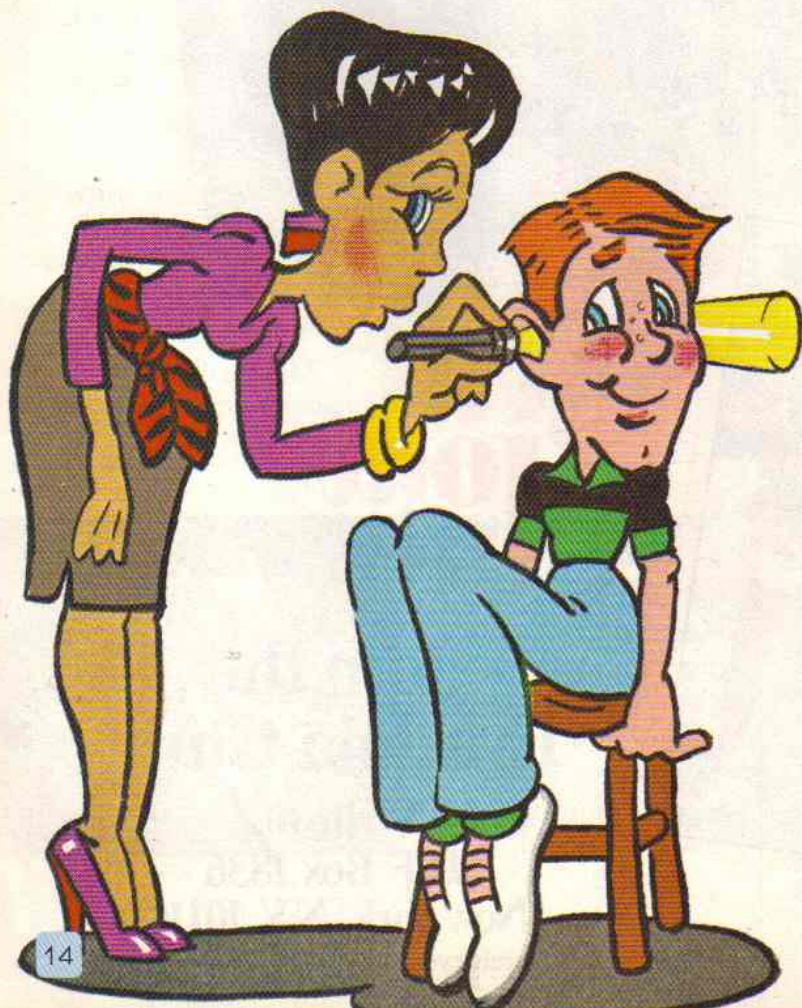
Believe it or not, the wax is in your ears to help keep your ears clean. With clean ears, you'll be sure to have sharp hearing.

When you clean your ears, you can only reach the outer part of each ear. Since you can't get all the way into your ear to clean it, your ear has to clean itself. The gooey, oily wax helps do that cleaning job.

Wax is made by glands that are in your *ear canal*. The ear canal is a tube that connects your outer ear with your inner ear, deeper inside your head. Wax catches dust, dirt and even itty bitty bugs so they can't go deep into your ear and cause trouble.

Sometimes the wax itself can cause trouble if you push it into your ear canal. So don't try to clean out the wax. It's doing its job—cleaning. If your ears need a real cleaning—see a doctor.

Question sent in by Melissa Martinez, Irving, TX.



Do you have a question that no one seems able to answer? Why not ask us? Send your question, along with your name, address, and age, to:

Any Questions?
3-2-1 CONTACT
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How many computer languages are there?

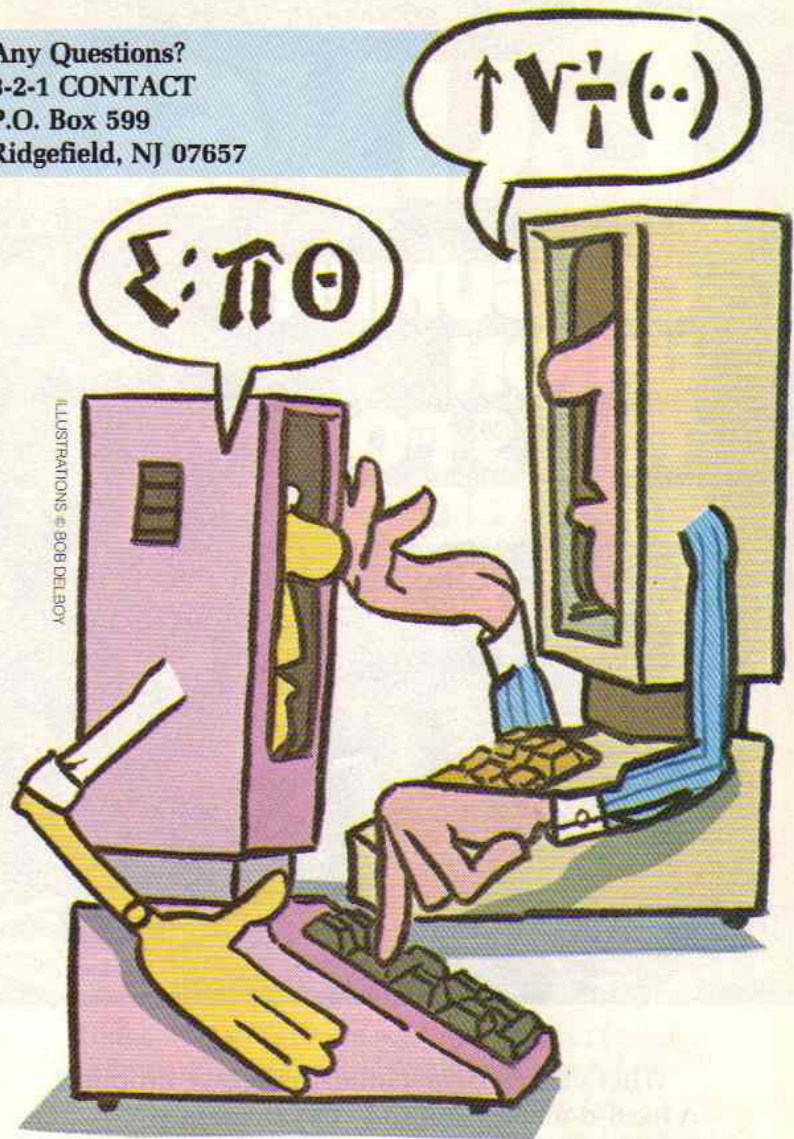
It's hard to keep track of how many computer languages there are because new ones are being invented all the time. Right now, there are over 200, but only 30 or so are commonly used. BASIC is one of the most popular and comes with most home computers.

Some languages are all-purpose like BASIC. You can use them to solve a problem, draw a picture or create a video game. But many programming languages are designed for one particular job. COBOL is a computer language that is used in many businesses. And Fortran was written to help scientists with their work.

Sometimes a programmer has a job that can't be done easily with any available language. So he or she will invent a new language that does what is needed. But the only people who learn this language are the programmer and the other people he or she works with.

Question sent in by Cherisse Trotman, Jamaica, NY.

Written by Cynthia Jabs



Why do raccoons come out only at night?

Raccoons aren't just night animals. If it's quiet and there are no people around, raccoons might come out in the daytime—especially in the early morning. But in the noisy cities and suburbs, they are “night owls.”

Raccoons are some of the peskiest animals ever to knock over a garbage can. For years and years, people have tried to stop these pests by hunting and setting traps for them.

To protect themselves, the masked animals have learned to hide from people. Raccoons spend most of the day resting in trees. They come down to the ground and hunt for food at night.

Raccoons eat mostly fish and frogs found in streams and lakes. They also eat fruit, nuts and green plants. And, of course, they are great garbage lovers and search for leftovers in trash cans—after dark!

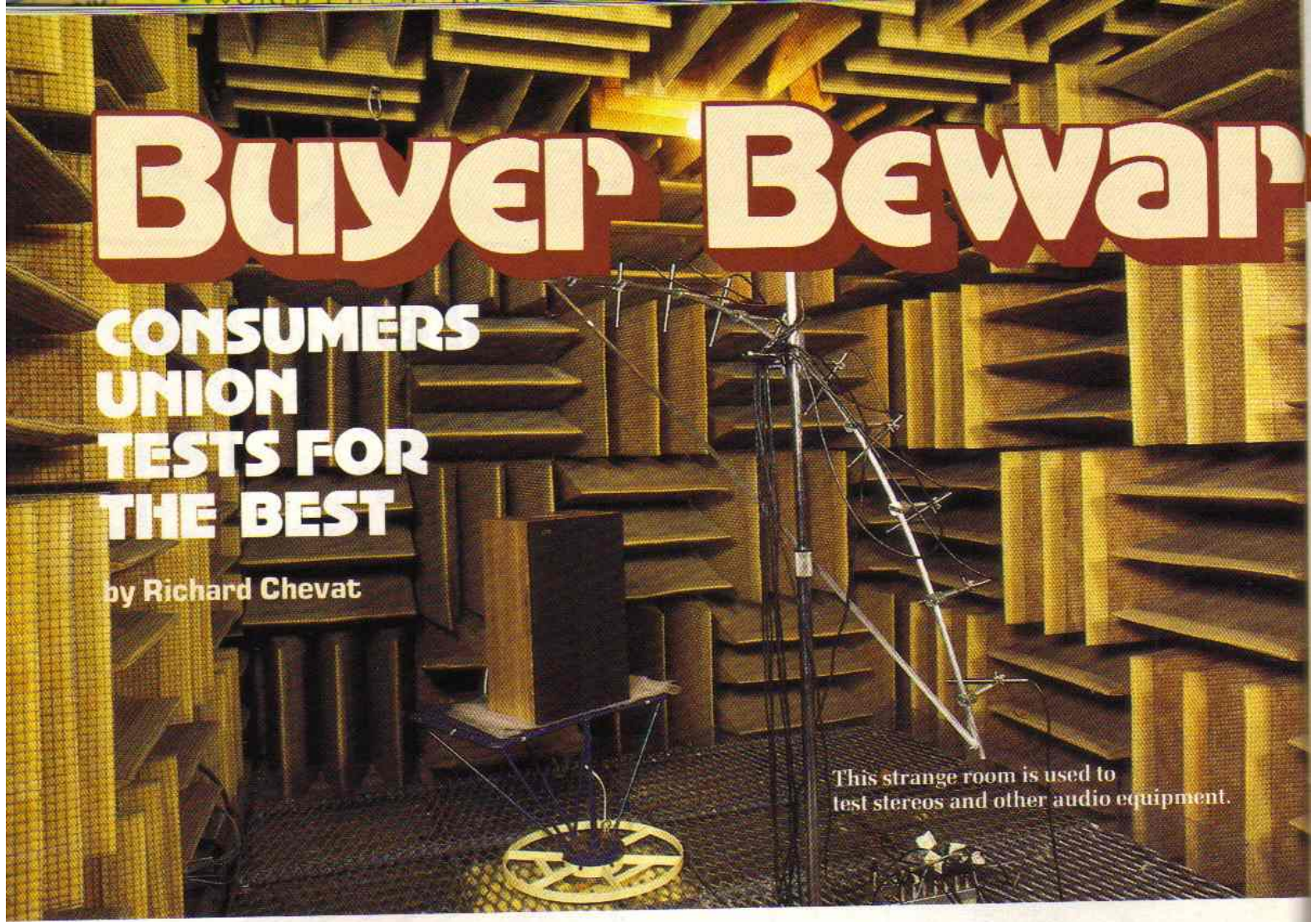
Question sent in by Jeffrey Miller, College Station, TX.



Buyer Beware

CONSUMERS UNION TESTS FOR THE BEST

by Richard Chevat



This strange room is used to test stereos and other audio equipment.

What's a sneeze machine? A luggage dropper? A toast-o-meter? You can't buy them in your local hardware store. You can't order them through the mail. These one-of-a-kind inventions can be found in just one place—the testing labs of Consumers Union (CU).

Consumers Union tries to answer the questions that you ask every time you buy something. Does one brand of detergent really work better than another? What's the best make of television set? The tastiest chocolate cookie?

To find the answers, CU has a staff of engineers and testers that use and sometimes misuse products. They try to find out how well each model works and how it stacks up against other brands. Then they print the results in their magazine, "Consumer Reports."

As CU's Assistant Director, David Berliner told us, "There are very few ways that a consumer can get a realistic view of a product before buying. Advertising is almost always one sided. It's designed to get you to buy. That's where Consumers Union comes in. We don't set out to

knock products or to sell them. We just want to let people know the whole story—if it's great, if it's average or if it's a lemon."

Consumers Union's Dirty Laundry

The Consumers Union engineers test everything from radish slicers to record players. Sometimes it's a dirty job. Just ask Mike Williams, one of the senior testers.

Last summer, Mike worked on a project to test laundry detergents. Naturally, if you're going to test laundry detergents, there's one thing you'll need a lot of—dirty laundry! Supplying the dirty laundry was part of Mike's job.

No, he didn't save his dirty socks for a month. Instead, Mike made up eight stains to put on pieces of white cloth. For example, to get a good grass stain, Mike had to mow some grass, put it in a blender and make grass soup.

The stains were put on dozens of pieces of cloth. Each stain was washed with 11 different detergents. By the time he was done, Mike had washed over 60 loads! Even after all the work,

e!



Above: Chocolate syrup, grass “soup” and other stains used to test laundry detergent.

Below: Mike Williams shows off some of his dirty laundry.

Mike still enjoys his job.

“This place is an engineer’s paradise,” he told CONTACT. “You learn to improvise. If you need something that doesn’t exist, then you just make it.”

Give Us A Sneeze, Please

That’s why the sneeze machine was invented. A couple of years ago, CU wanted to test different brands of tissues. They wanted to see which brands were strong enough to stand up to an average sneeze. The only problem was figuring out what an average sneeze was.

Naturally, the only solution was to invent the sneeze machine. The sneeze machine was a gadget that blew a mixture of air and water onto tissues. Using it, the CU engineers could be sure to get the same strength sneeze every time.

The luggage dropper was another CU invention. It tested handles on suitcases by picking them up and dropping them 25,000 times in two days! The testers figured that was equal to 10 years of normal use.

Sometimes, CU testers don’t have to invent anything to test a product. When they wanted to see how strong door locks were, they just took turns kicking in test doors. And of course, the testers also use some hi-tech equipment, like KEMAR or Knowles Electronic Mannikin Acoustic Research.

KEMAR is a dummy used to test headphones →



PHOTOS © BRUCE E. MCCANDLES

Right: Mary Tobias' kitchen is one of the most popular places at Consumers Union.

Below: The toast-o-meter was really made to be used by artists and designers, but Mary uses it to test toasters.



and speakers. When a pair of headphones is placed on KEMAR's head, sensors in his "ears" help engineers measure sound levels.

The Toast of the Testers

One of the most popular places at CU is Mary Tobias' kitchen. Mary is CU's home economist. It's her job to test kitchen appliances and food products. That explains why her work area is so popular—Mary's test results can be delicious!

"When we tested waffle makers, I must have gained 10 pounds," says Mary. "And of course, we couldn't just test plain waffles, we had to test them with vanilla ice cream."

Mary uses a little device that could be called a toast-o-meter. It is a series of colored strips that go from very light to very dark brown. They were designed to be used by artists, but Mary uses them to test toasters. A good toaster should be able to make toast that is very light, very dark or any shade in between. The toast-o-meter

helps Mary to compare how well the different toaster brands perform.

Mary enjoys helping other people become good consumers. "Because I use these appliances, I can see things that some of the engineers overlook. I have a lot of appliances at home and sometimes I use my family as guinea pigs."

Look Ma, No Brakes!

Don Mays was a mechanical engineer before he became a tester for CU. His interest in mechanical things goes back to when he was a boy.

"When I was a kid, I built my own minibike," Don told CONTACT. "I used a lawn mower engine and built my own frame, clutch and gears. I was so excited when it worked that I didn't bother to finish it. I never put brakes on it. That summer I wore out three pairs of shoes stopping that bike."

Nowadays Don tests large home appliances like refrigerators for CU. He uses a strange mixture



PHOTOS BY BRUCE E. MCCANNLES

Above: This dummy is named KEMAR. It is used to test headphones and other audio products.

Below: Don Mays gets steamed up over room humidifiers.



of equipment in his work.


"We use frozen chopped spinach to test freezers. In fact, it's used by the whole refrigerator industry. Spinach has the right weight and bulk to be used as an average food. We also use an environmental chamber. That's a room where we can control the temperature and humidity. That way we can test how the appliance works under different conditions."

We asked Don if he had any advice on how to be a good consumer.

"You have to be curious—talk to the salesman and try to get an idea of how things work. And you should never be afraid to take things back or write to the company if you're not happy with what you've bought."

David Berliner also had some advice for shoppers. "Think before you buy. That's very important. Don't buy anything just because someone in a commercial tells you it's good. And don't buy something just because other kids have one. Only you can know what you really need."

Of course there's a lot more to being a good consumer. (For more tips, see our interview with Betty Furness on the next page.) But it's something everyone can and should learn. Being a good consumer can save you a lot of money and trouble. And, if you get really good at it, you might grow up to be a product tester at Consumers Union.

So think of that next time you go shopping, and don't forget to bring your sneeze machine! 



Above: This machine tests household cleansers. It moves the sponge back and forth over a piece of tile.

★ SMART SHOPPING ★

EXPERT TIPS ON GETTING YOUR MONEY'S WORTH

by Russell Miller

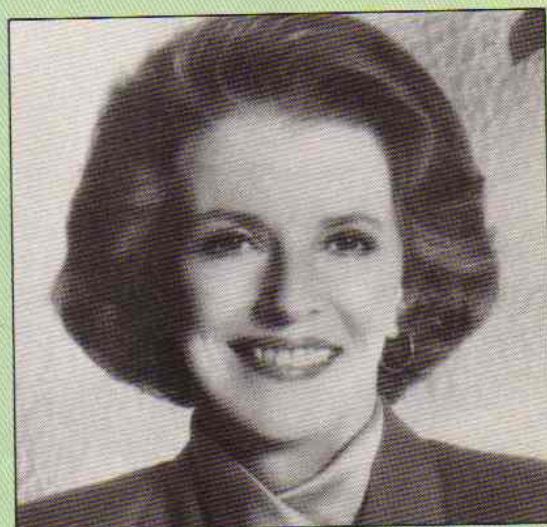
When a group of kids in Florida suspected they weren't getting enough cherries in their McDonald's cherry pies, they did two things.

First, they counted. They counted the cherries in the picture on the wrappers, and they counted the cherries in the pies. When they decided there were fewer cherries than promised, they contacted McDonald's—and Betty Furness.

For 11 years, Betty Furness has been helping TV viewers solve consumer problems. These are problems with products that don't work or promises that aren't kept. CONTACT visited her at NBC-TV in New York City to find out how kids can be better buyers.

Better Buying

"My advice is shop around," says Ms. Furness. "Decide how you want to spend your money. Don't buy the first thing. Depending on what you want, be sure you get the best. If you don't want the best, be sure you get the cheapest!"



Meet Betty Furness!

Many kids don't realize that the same item sells for different prices at different stores. "If you're crazy about going to the fancy store, you should understand that it's costing you a little more to do that," Ms. Furness notes. Only you can decide if the fun of shopping at a fancy store is worth the extra money.

- Be careful when you see famous actors or sports stars advertising a product. Stars are paid a lot of money to recommend products. And even if they really like the product, the stars may never have tried another brand.

"It's fun to think you're wearing or using something that someone you look up to is wearing or using," says Ms. Furness, "but it just doesn't mean very much."

- Know what you're buying before you buy it. One of the best sources of information can be commercials. But to get the most out of ads, pay attention to all the little messages like "batteries not included" and "assembly required." (That means you have to put the product together.)

- Read the information on the product's package. The package shows what the product looks like and tells what it does. That information is a



Read the label, then make up your mind.

promise to you from the people who made it—a promise that the law says they have to keep.

"A lot of kids," says Ms. Furness, "probably feel the way adults used to feel: If a toy breaks, the buyer did something wrong. That may be so—but it's possible that the toy wasn't made right in the first place."


Making Things Right Again

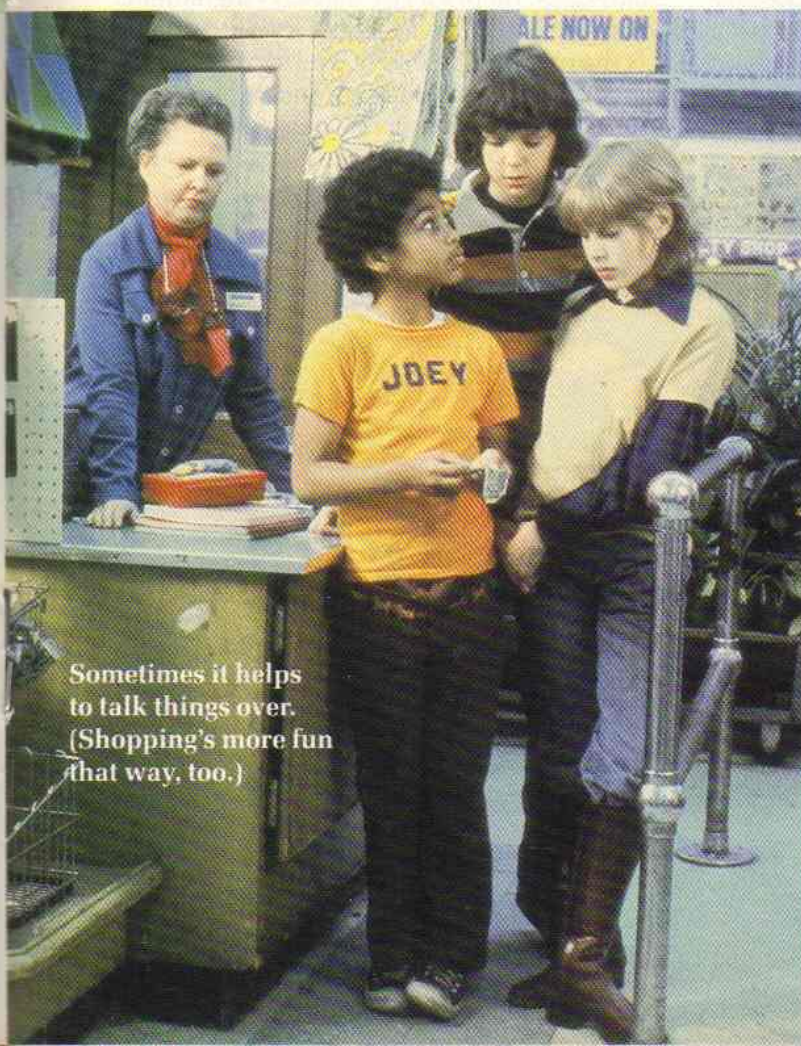
If a product doesn't work, don't give up! You can write to the manufacturer. Explain what happened and ask why. Manufacturers will listen to you because they want you to keep buying their products.

"Kids can have a lot of fun if they think of themselves as consumers," notes Ms. Furness. Get together with other kids to talk about products you've bought, prices you've paid, what you expected, and what you got.

If you think you've found a problem, check your facts and talk it over with an adult. Then, if you're right, go back to the store where you bought the product or write to the manufacturer and get to the bottom of the problem.

That's what the kids in Florida did when they suspected McDonald's was being cheap with cherries. When Ms. Furness reported the story on nationwide TV, McDonald's said the kids were wrong—that they expected too much. Perhaps. But in less than a month, McDonald's started buying more cherries for its pies.

"Those kids did it," says Betty Furness. "They did it all by themselves." 



Sometimes it helps to talk things over. (Shopping's more fun that way, too.)

PHOTOS ON THIS PAGE BY RICHARD HUTCHINGS

What's on a Label?

A CONTACT QUIZ

by Mary A. Fischer

Do you know what's in your favorite candy bar? There's an easy way to find out. Just read the label on the package.

Labels tell you a lot. You can use them to find the most chocolatey candy bar, the freshest ice cream and the nuttiest peanut butter. But only if you know what to look for.

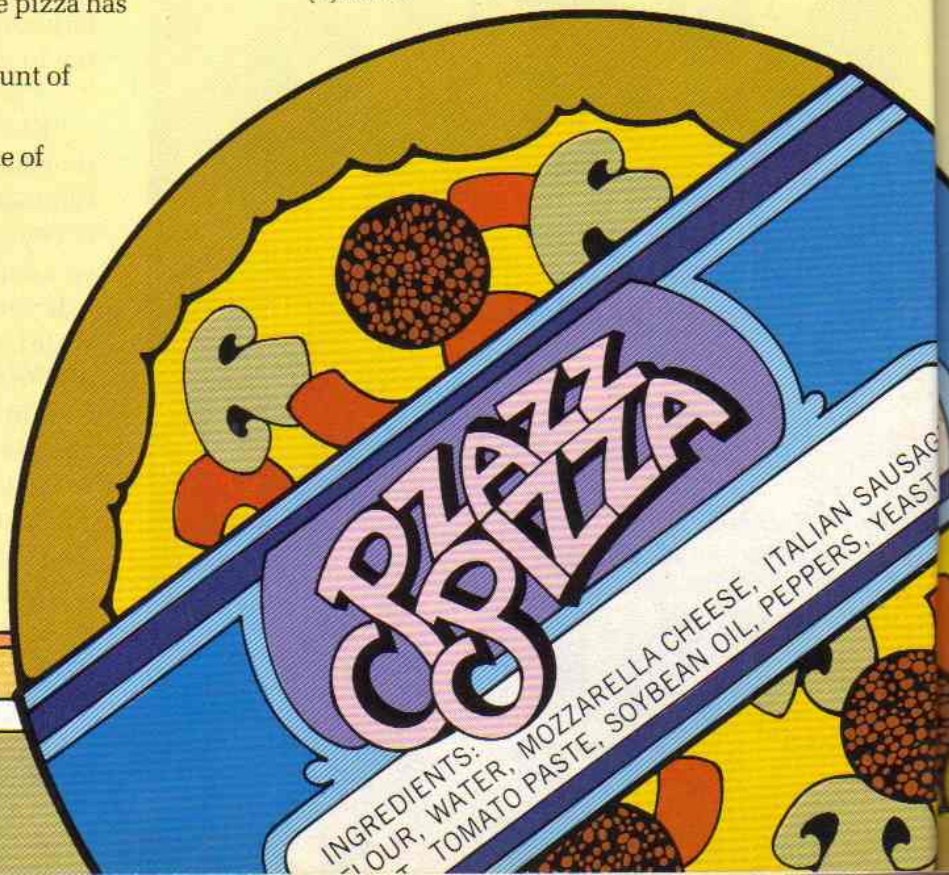
Here's a quiz that shows you some of the things you can find out from reading food labels. Read each question. Circle the letter next to what you think is the correct answer. To find out if you were right, read the answer after each question.

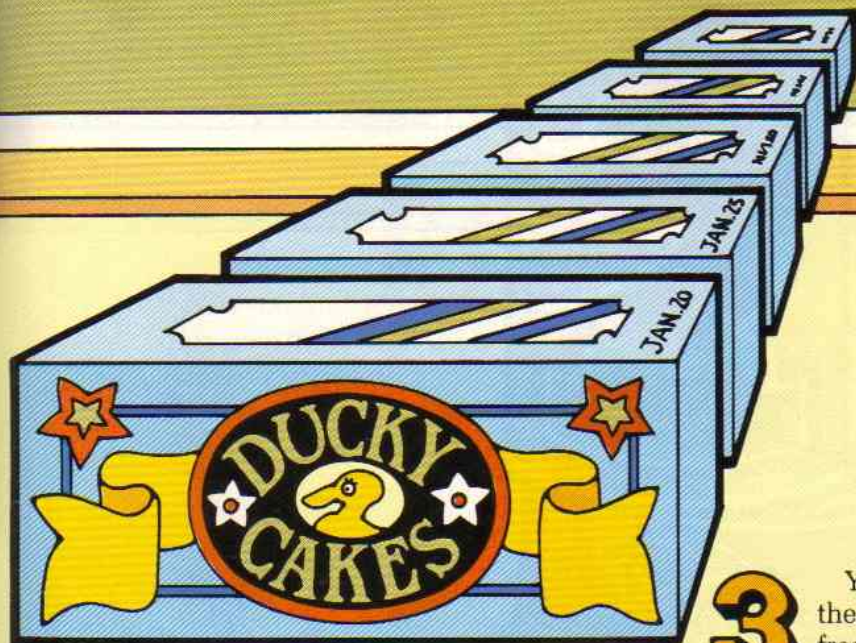
1

Almost all foods have a list of ingredients somewhere on the package. Below is a box of Pzazz Frozen Pizza. On the front is a list of what's in it. Can you tell from this list which ingredient is the one there is the most of?

- a. Flour, because it's listed first.
- b. Tomato paste, because pizza has lots of tomatoes.
- c. There's the same amount of everything.
- d. You can't tell. It's none of your business.

Answer: It certainly is your business. The U.S. government wants people to know what they are eating. So there's a law that says ingredients must be listed in size place, with the thing there is the most of listed first. The second listed is the second biggest ingredient, and so on. On this label, the answer is (a) flour.





2 You want to buy a fresh cake for your sister's birthday party next week. When you go to the grocery, there are dozens of the Ducky Cakes there. How can you pick the one that will stay freshest the longest time?

- a. Take the one in front—it just came in.
- b. Look at the date stamped on top of the package, and take the one with the latest date.
- c. They're all the same—there's no difference.
- d. Squeeze the package and take the softest one.

Answer: Cakes and other foods—like milk, cheese, bread and potato chips—spoil after a short time. So companies have to stamp a date on the package to tell how fresh it is. Usually the date is the last day that package can be sold. So if one cake is stamped "Jan 20" and another is stamped "Jan 25," the second one will stay fresh longer. The answer is (b).

3

You love the taste of fresh oranges. But you don't

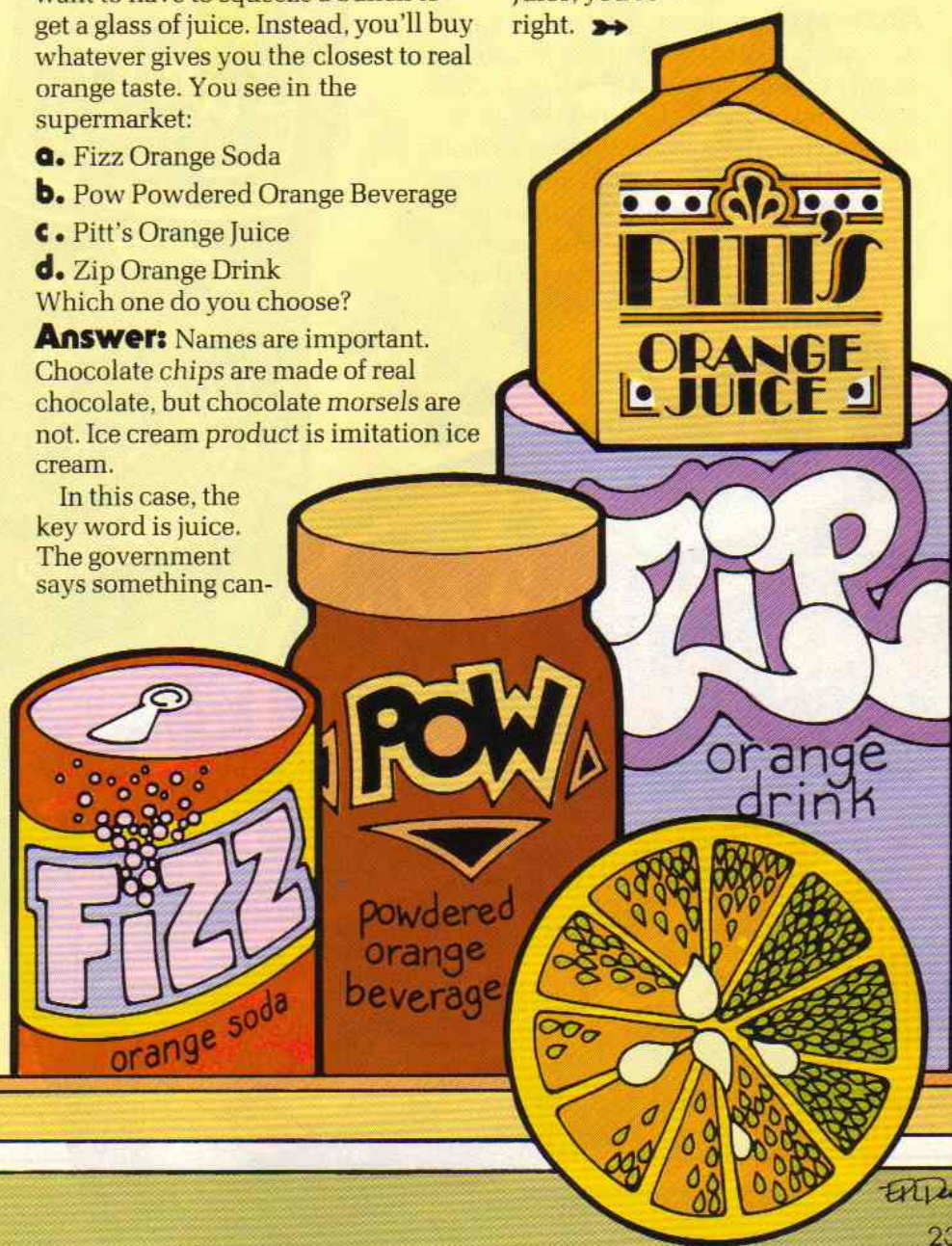
want to have to squeeze a bunch to get a glass of juice. Instead, you'll buy whatever gives you the closest to real orange taste. You see in the supermarket:

- a. Fizz Orange Soda
 - b. Pow Powdered Orange Beverage
 - c. Pitt's Orange Juice
 - d. Zip Orange Drink
- Which one do you choose?

Answer: Names are important. Chocolate chips are made of real chocolate, but chocolate morsels are not. Ice cream product is imitation ice cream.

In this case, the key word is juice. The government says something can-

not be called juice unless it is made from at least 10 per cent juice. That may not sound like much, but it's more than the others have. So other names like "drink" are made up. Orange "Drink" is made of mostly water and sugar. Orange "Soda" doesn't have any real orange taste at all. And Powdered Orange Beverage contains things that make it taste like oranges, but not one real orange goes into it. If you said (c) Pitt's Orange Juice, you're right. ➔



4

You can see three cans of spaghetti and meatballs on the shelf. Their names, though, are slightly different. You want the one with the most meat in it. Which one do you choose?

- a. Spaghetti with Meatballs
- b. Spaghetti and Meatballs
- c. Meat-flavored Spaghetti

Answer: Here again, the name is important. Anything that is “with” something usually doesn’t have that much of it. The same thing is true of “flavored” things. If you want the most meat with your spaghetti, stick with plain old spaghetti *and* meatballs. The same thing is true with many other things, like beef stew. That has more beef in it than beef-flavored stew or stew *with* beef.



5

You go to buy bacon. The package you pick up looks like bacon. But when you come home, you notice it says, “Breakfast Strips.” What have you got there?

- a. Bacon, just like you wanted.
- b. Bacon mixed with something else.
- c. Something made out of a different food entirely.

Answer: Again, you’ve got to watch the names. Some people don’t want to eat bacon—so they buy “breakfast strips.” These strips are usually made from another kind of meat. They look and taste something like bacon, but they’re not. If you want bacon, don’t just look at the package—read it! The answer is (c).



ILLUSTRATION © ELSIE DENTON

Dot's All Folks!

Can you find your way through this maze of dots from the red START to the red FINISH?

Here's what you do:

1. Using a pencil, draw a line from one red dot to another. Draw straight lines only. Your lines

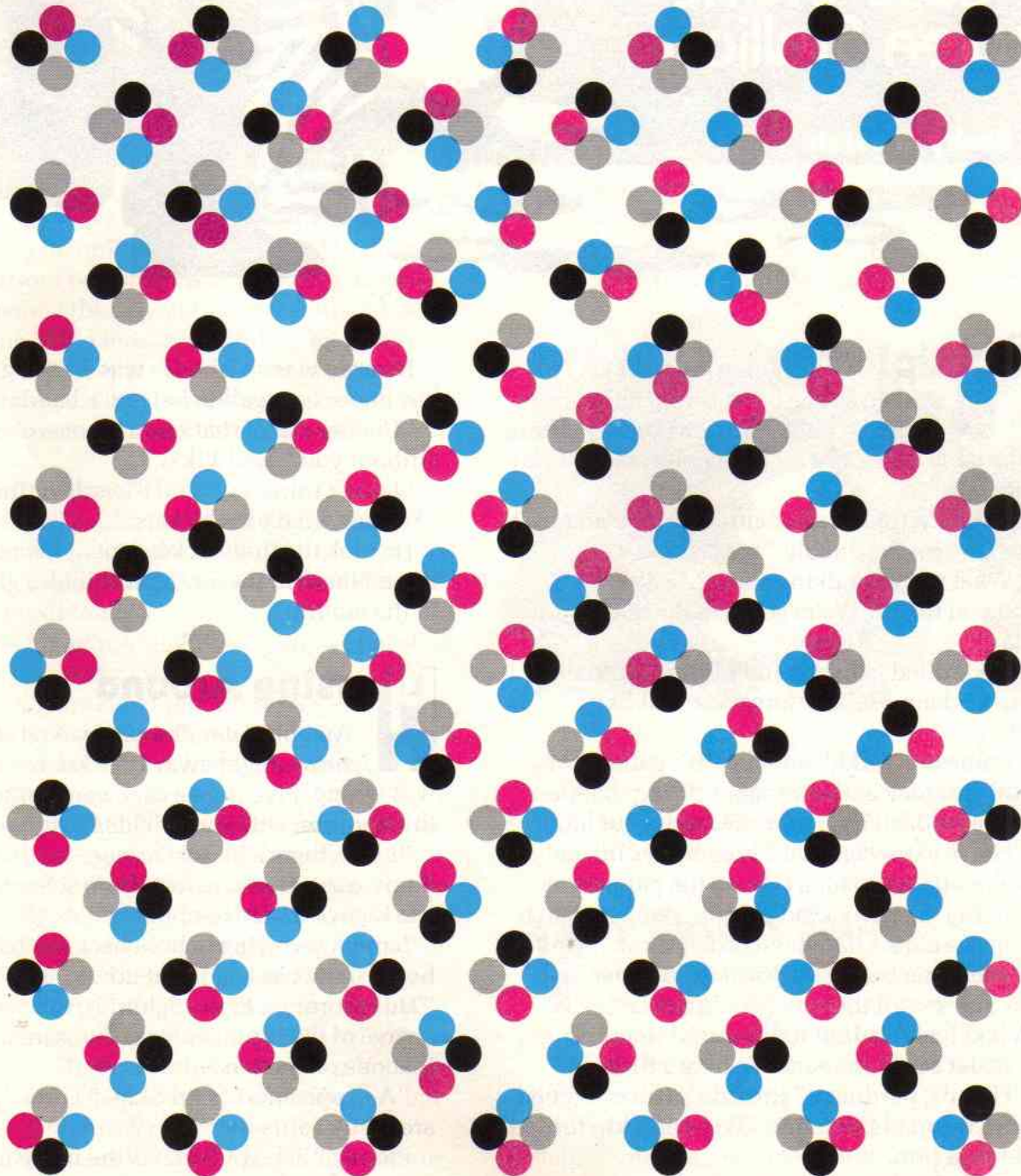
may not touch any dots except the red ones.

2. After you're done, see if you can go from the black START to the black FINISH using the black dots. Be careful. It's a bit trickier!

Answers on the Did It! page.

START

FINISH



START

FINISH

de Moya

THE BLOODHOUND GANG

The Case of the Stolen Stallion

by Becky Cheston

ILLUSTRATIONS BY BOB PEPPER



Skip! What's going on?" Vikki asked as she burst through Ricardo's kitchen door. Skip was calmly sitting at the table, reading a magazine. It was Saturday morning.

"What's wrong?" she panted. "You said to get over here on the double."

"What are you talking about?" asked Skip. "Did you forget? We're going to the horse show today!"

Vikki rolled her eyes and plopped into the nearest chair. She had forgotten. But Skip hadn't.

"Come on, Vikki," he said. "It's going to be great! Just look at this program!" Skip handed Vikki a colorful flyer and she read it out loud.

"Horse extravaganza! Three shows in one! Saddle up and go for a ride on the palominos from 'Big' Lee Brockton's riding stables! Watch Jimmy Samms's daredevil rodeo show....And the star attraction, The Royal Lippizaner Stallion Show—all the way from Austria!"

Vikki had to admit it did sound interesting.

"So let's go," she said. "Where's Ricardo?"

"Howdy, pardners!" Ricardo's voice boomed from the top of the stairs. Vikki and Skip turned to look at him.

"Oh, no!" Skip groaned.

Ricardo was a sight. He was wearing red cowboy boots, a 10-gallon hat and a bandanna.

"Change out of that costume or we're going without you," said Vikki.

"I don't think so," said Ricardo, grinning. "You see, I have the tickets."

He took the three tickets out of his pocket and waved them in the air. "Never look a gift horse in the mouth!"

Horsing Around

An hour later, the trio arrived at the show. Right away they knew something was wrong. Five police cars were parked outside the stadium, with their lights flashing.

"Look, there's Jenny Farmer," said Vikki. Jenny was a friend of hers from school. "Maybe she knows what's happening."

Jenny was trying to hold back her tears. "The horse show has been shut down," she told them. "This morning, Franz Schmidt, the man in charge of the Lippizaner stallions, discovered that one of his horses is missing!"

"A Lippizaner!" said Skip. "Those horses are really valuable!"

"Jenny," asked Vikki, "is the horse just missing or was it stolen?"

"I was hoping you guys could find out," said Jenny.

"Oh no," groaned Skip. "I wanted a day of fun, and now we're saddled with a case."

"You know us," said Ricardo "When there's a job to do, we never say neigh."

Inside the stadium, Jenny led the Bloodhound Gang to the section of the stalls where the 12 Lippizanners had been stabled. Franz Schmidt was pacing up and down, running his hands through his thick white hair. He was pulling on his enormous white moustache. The blue eyes behind his thick glasses looked sad.

"Oh!" he exclaimed when Jenny introduced them. "These young people are going to find my Ferdinand?"

"We'll try," said Ricardo, "but first we have to know what Ferdinand looks like."

"What he looks like? He's a Lippizaner!" exclaimed Schmidt. "Specially bred to dance and leap and perform. Here, look for yourself!"

He opened the gate to the next stall and there stood one of the most beautiful animals they'd ever seen. The Lippizaner was not very tall, but his back was long, and his legs and shoulders were very muscular. His coat was white as snow.

"Wow!" whistled Skip.

"That is a Lippizaner," said Mr. Schmidt.

"No other breed of horse is like it."

"Mr. Schmidt," asked Vikki, "when did you last see Ferdinand?"

"It was about midnight last night—I checked on all the horses myself."

Schmidt explained that there was only one way in or out of the stadium and it was guarded.

"Then we better check with the guard," said Skip.

The Gang went to the stadium gate to talk to Ben Rogers, the guard who had been on duty the night before. Jimmy Samms, the manager of the rodeo show, and "Big" Lee Brockton, owner of the local riding stables, were already there. So were the police. They were questioning Rogers.

"I'm innocent!" Rogers was saying. "Why won't anyone believe me?"

A police officer frowned at Rogers. "You say you didn't see anyone leave with a horse—but there's no other way out of here!"

While Skip and Vikki watched Rogers being questioned, Ricardo wandered off.

"Look at this!" he yelled suddenly. There, in the dirt outside the gate were two sets of tracks: hoofprints and footprints.

"Wow!" yelled Skip. "Whoever made those footprints must wear size 12 shoes!"

"What's your shoe size, big guy?" a police officer asked Lee Brockton.

"Size 12," Brockton said, in almost a whisper.

"Did you hear that?" Skip said to Vikki and Ricardo. "That makes him a good suspect."

"I don't know," said Ricardo. "There's something funny about these footprints."

"Like what?" asked Skip.

"Well, remember, it started raining around nine o'clock last night—before Ferdinand disappeared. Now look at how wet and soft the ground is."

"Yeah, so?" asked Skip.

"So," said Vikki, catching on, "look at those hoofprints. They're very shallow. Pretty weird for a 1,000 pound horse walking on squishy



ground. And those footprints are faint also."

"Well, how do you explain it?" asked Skip.

"I don't know. I guess we'll just have to use some horse sense," joked Ricardo.

The Case is Stalled

The Gang went back to the stables to look for more clues. There they met Mr. Schmidt. He looked even more upset than before.

"Mr. Schmidt," asked Vikki, "how many horses are in the show?"

"Well, let's see. There are eight from the riding stables, nine in the rodeo show and I had 12." His frown grew bigger. "Now I only have 11." →

"We'll find Ferdinand for you," said Skip, as the trio started investigating the stables.

First they looked at Lee Brockton's horses. There were eight: two Palominos, a Shetland pony and five Appaloosas.

"Too bad we can't ask the horses some questions," said Skip.

Ricardo laughed. "Oh," he said, "you mean like a gallop poll?"

Jimmy Samms's rodeo show was kept in a different part of the stables. Each stall had a sign, with the name of the horse, its age and breed. They were looking at the ninth horse, a



ILLUSTRATION BY BOB FEEPER

three-year old thoroughbred named Samms's Pride, when Skip noticed something.

"Something's not right here," he said.

"I'll say," said Ricardo, pinching his nose.

"The smell is terrible—like ammonia."

"That's not what I mean," said Skip, running off. He came back with a tape measure in his hand. Then he climbed up on a stool and measured the horse. Next, he gently opened the horse's mouth and looked inside.

"What are you doing?" Vikki asked.

"I've got news for you guys," said Skip.

"Samms's Pride is no thoroughbred."

"What?" said Ricardo. "How do you know?"

"A thoroughbred is at least 16 hands high," answered Skip. He explained that a horse is measured in hands. One hand is equal to four inches. The height is measured from the ground to the top of the horse's shoulder.

"This horse is barely 15 hands high," said Skip. "And he's no three-year-old, either."

"You can estimate a horse's age by looking at its teeth," said Skip. "When a horse is young, there are marks or grooves in its teeth. But by the time a horse is about nine years old, the grooves have all been worn down. This horse has got to

be at least nine—his teeth are smooth!"

"Looks like Mr. Samms has been tricked," said Vikki.

Just then Ricardo entered the stall. "On the contrary, my dear Vikki," he said. "It is Mr. Samms who is the trickster!"

Ricardo held up five empty boxes of chestnut hair dye.

"I found them under an old blanket," he said.

"That explains the smell," said Vikki.

"And these explain the footprints." Ricardo held up a pair of large boots and two horseshoes glued to the ends of sticks.

"Mr. Samms must have worn the boots to try and pin the crime on Lee Brockton! He used the horseshoes to make it seem like Ferdinand was taken out of the stadium," said Skip.

"I have an idea," said Ricardo. "Let's put on a little horse show of our own."

The End of the Tail

A few minutes later everyone was gathered on the stadium field. In the center, Vikki and Jenny Farmer lugged a couple of buckets to the main attraction—Samms's Pride. They began scrubbing the horse with heavy brushes.

To everyone's amazement, the horse's deep chestnut coat began to turn white.

"It's Ferdinand!" yelled Franz Schmidt, running over to hug his horse.

"I'll bet you're just dye-ing to tell us how you did it," wisecracked a police officer as he led Jimmy Samms away.

"Now that," said Ricardo, looking at Ferdinand, "is a horse of a different color!"

**Watch for next month's
Bloodhound Gang
mystery!**



ILLUSTRATION BY DAVE FEE BLAND

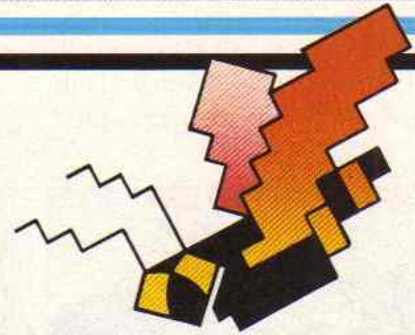
ENTER

THE
HIGH-TECH
WORLD OF
COMPUTERS

Binary Bee

This binary bee is bumblng its way toward the center of this

beautiful flower. See if you can bee clever enough to help it along. And bee careful not to run into dead ends! **Answer on the Did It! page.**



newsbeat



In the Biotron, scientists grow crops in any climate.

PHOTOS COURTESY OF UNIVERSITY OF WISCONSIN BIOTRON

The Whole World Under One Roof

by Diane Molvig

How would you like to travel from the Arctic to the tropics in just three minutes? That may sound like space warp travel. But there is a place where you can make that journey simply by walking a few steps. It's called the Biotron, and it's at the University of Wisconsin.

The Biotron is an almost windowless, three-story brick building that looks rather ordinary from the outside. But inside some amazing things are going on. With the help of computers, technicians working there can create any kind of environment found on planet Earth—or off it. One room may be hot and humid like a tropical jungle. Another room down the hall is as cold as the South Pole. In still another room, conditions may be like those found in outer space.

There are 48 different rooms in

the Biotron. In each one, scientists can select the temperature, humidity, air pressure, wind velocity (speed) and amount of light. Even after the scientists go home, the Biotron keeps running under the watchful eyes of the computers.

These specially designed “worlds” allow scientists to do research they couldn't do in the real world. Dr. Theodore Kozlowski, the Biotron director, told CONTACT, “In the outdoors, no two days are ever exactly alike. But in the Biotron, we can precisely control conditions. And unlike in nature, we can change one condition, like the temperature, without changing any of the others.”

Potatoes in Space

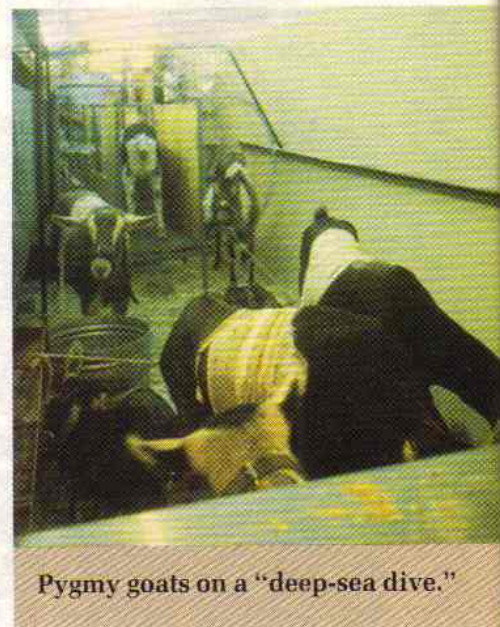
Since the Biotron was built 20 years ago, it has been used to carry out hundreds of studies. For example, a plant researcher wanted to find out how potatoes would grow on a space station or lunar colony. Instead of launching his laboratory

into orbit, he used the Biotron to create outer space conditions.

In another experiment, scientists studied the effects of deep-sea diving. They put pygmy goats in a chamber and created the conditions of ocean depths down to 1,000 feet below sea level. By sending the goats “diving” in a safe way, scientists learned more about how such a trip would affect humans.

Right now, Dr. Kozlowski is studying how trees react to pollution. He hopes to find out what conditions, such as warmer or cooler temperatures, help trees to resist pollution. He also wants to find out how certain trees can help clean up the air.

Over the years the Biotron has been a home for bees, turtles, sheep, monkeys, Siberian cranes and horses—just to name a few. In the process, scientists have learned more about our world and how plants, animals and humans can better live on it.



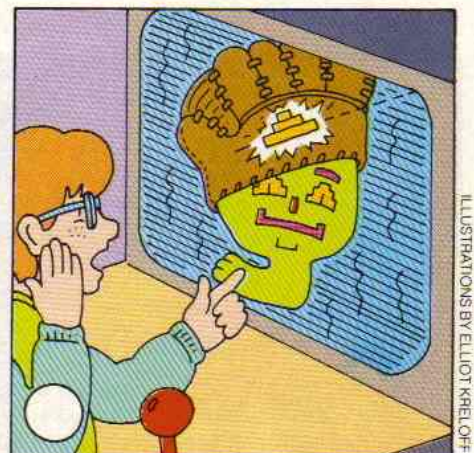
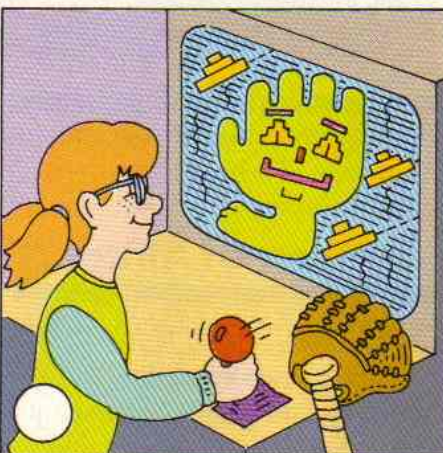
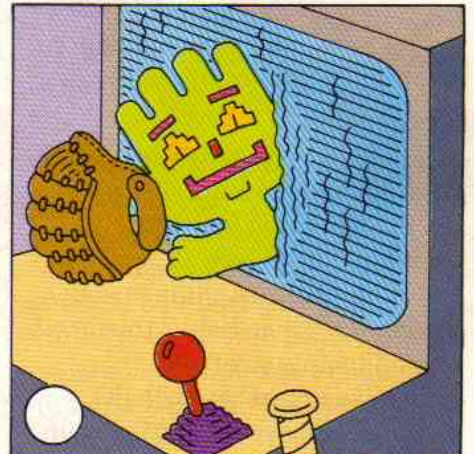
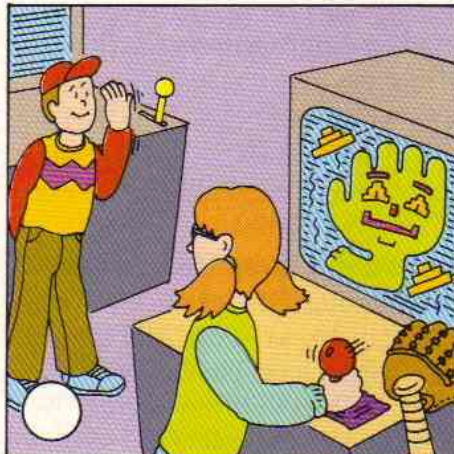
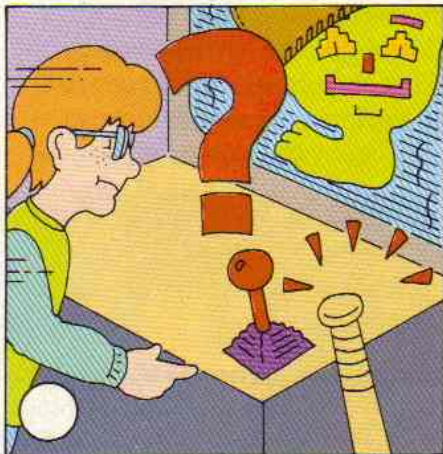
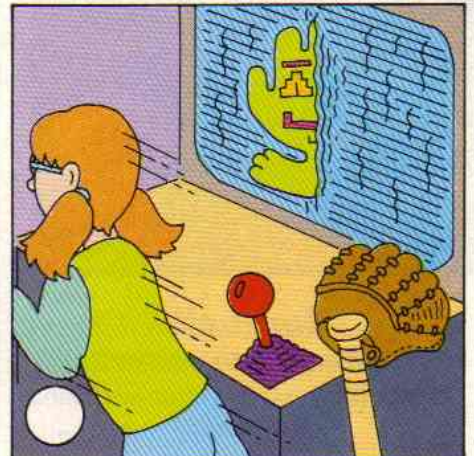
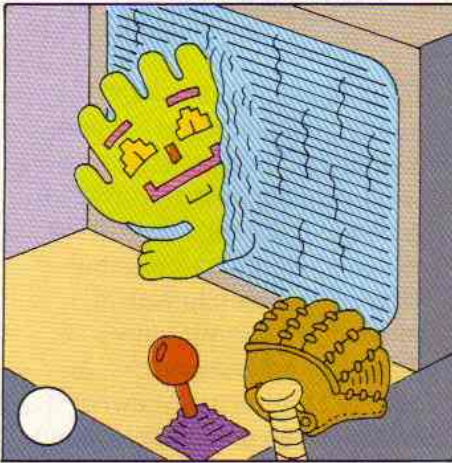
Pygmy goats on a “deep-sea dive.”

CRAZY COMICS

Arcade Antics by Patricia Berry

This comic strip tells a story—but right now it's a little mixed up. See if you can put the pictures in

the correct order. (We've numbered the first one to get you started.) Check your answer on the Did It! page.



ILLUSTRATIONS BY ELLIOT KREILOW

REVIEWS

by Phil Wiswell and Bill Gillette



Hardball

(Accolade; Apple II, \$35; also for the Commodore 64)

For most people, especially baseball fans, all it takes is one look at one pitch in *Hardball* to make them ask, "Can I get this on my computer?"

The game gives you amazingly realistic "camera angles" of a pitcher and batter in a major league baseball game. (When the ball is hit, the view shifts so you can see the whole field.) You take turns pitching or batting.

Just like in real baseball, the batter has almost no time to decide whether or not to swing at a pitch. So you have to guess about what kind of pitch the computer (or other player) will throw at you. If you're the pitcher, you have 16 different pitches to choose from.

Wrap-Up

Bill: Definitely the best baseball game I've played. Excellent graphics!

Phil: Of several dozen video baseball games we've looked at, this is my favorite. The graphics are wonderful and the action is good.

The Dolphin's Rune

(Mindscape; Commodore 64, \$30)

Some might call this game a "beautiful experience." Others might call it "weird." But it's safe to say you've seen nothing like it.

There isn't a lot of pressure to perform in this program. In fact, you can play a single game for hours on end without "dying." The point is to get into the video world of the dolphin, and to learn to do things the dolphin must do, such as avoiding fishing nets and coming up for air.

There are many stages to this game, each of which involves finding a clue on the ocean floor. The clues help you to decode a poem about dolphins. Mindscape is offering \$10,000 to the first person who can get all the clues and solve the puzzle.

Wrap-Up

Bill: I thought this game, if you can call it that, was weird. All I can say is it takes a lot of patience.

Phil: But it is a very involving experience. The colors and sounds are rich and absorbing. It was different, but I liked that and it's fun.



Computer Novel Construction Set

(Hayden IBM PCjr, \$50; also for the Macintosh and Apple II)

This poorly titled software is actually a fascinating game-making program that is very simple to use. Within minutes of tearing off the wrappings, you'll be writing your own text adventure game.

The setting is up to you, of course. It can be your house, school, the Amazon jungle, the Tower of London or anywhere else. Once you pick your location, you map out the position of all the rooms or areas. Then you write a description for each, and make up a list of words the player can use to explore your world. You can also booby trap some rooms, program events to happen at certain times, and much more. Several stories come on the disk, but they're not half as enjoyable as what you'll write.

Wrap-Up

Phil: I think this program is fabulous and encourage kids of all ages to use it.

Bill: It's very easy to use and that means you can concentrate on making up games instead of figuring out how to use the program.

Heart Of Africa

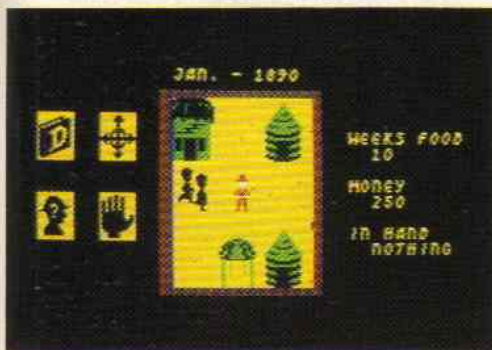
(Electronic Arts; Commodore 64, \$40)

Some players are calling this wonderful new game a follow-up to *The Seven Cities of Gold*, but

it's more than that. *Heart of Africa* is another world, another time. It's a fantastic action-packed historical trip back to the mostly unexplored African continent of 1890.

The object of the game sounds quite familiar: The player must find a lost tomb containing untold treasures, beginning with very few clues and a map. But the play is surprisingly fresh. You'll travel the Congo, the Niger and the Nile rivers. You'll search for 30 cities and towns where you'll trade for gold and equipment, and most important of all—for clues. The African people know many things that will help you, if only you can learn how to make them talk to you! If they become angry with you for any reason, forget it! You'll never find the treasure.

Graphics in this action adventure are super, as is the on-screen help. The computer automatically records a map of the regions you explore and keeps notes on your trips. And while you play you can't help learning about geography.



Wrap-Up

Billy: Anyone who liked *The Seven Cities of Gold* will love this! It's just as much fun but requires more strategy.

Phil: This game is not a history lesson. It doesn't have much to do with what really happened in Africa in the 1890's. But as an adventure game, it's great! Hats off to Ozark Softscape, who designed it!



Little People Computer Project

(Activision; Commodore 64, \$35; also for Apple II)

We always suspected there were little people living inside our computers, but we never expected them to give us recipes for veal parmigiana! Yes, this is a very strange computer program. It's a cross between an ant farm and a computerized doll house.

The screen displays the inside of a two-and-a-half story house, furnished with a refrigerator, stove, piano and other furniture. Each "house" contains a different little person who moves around, eats, sleeps and answers the phone, among other things.

What do you do? Watch a lot. You can also play a card game with your little friends. Or you can send them messages. Sometimes they will answer, if you've been treating them well and putting plenty of food in the refrigerator.

Wrap-Up

Bill: It's fascinating to watch your character walk around the house and do things. Mine is very forgetful and tends to leave doors open, but his dog Spot is always there to remind him.

Phil: *Little People* is fantasy at its best, where the unexpected happens delightfully often.

Fantavision

(Broderbund; Apple II, \$50)

If you'd like to be able to dazzle people with the graphics power of your Apple computer, you should look at *Fantavision*. It's a graphics drawing tool for creating your own full-color animated action sequences.

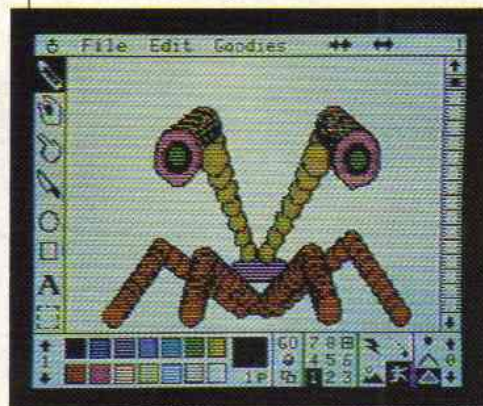
The neatest part about *Fantavision* is the way it actually does a lot of the work for you. For example, suppose you want to animate the lift-off of the space shuttle. First, you draw the space shuttle on its launching pad. Then you draw it in orbit. With one command, *Fantavision* automatically will draw up to 64 pictures of the shuttle in various stages between the landing pad and orbit.

There are many other goodies you can use, such as 3-D rotation. It's great to see an art program that doesn't require you to be a skilled artist.

Wrap-Up

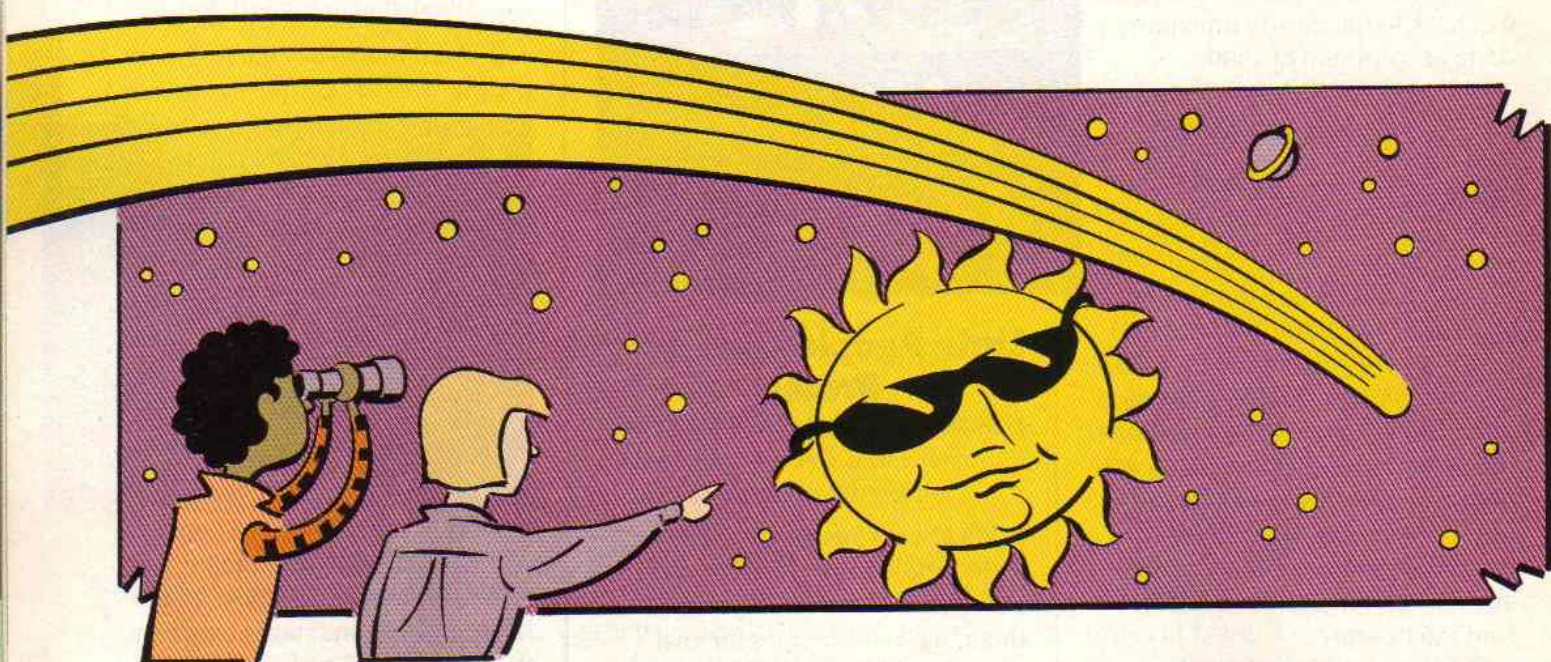
Bill: This is extremely easy to use which makes it much more enjoyable than many other graphics/animation programs.

Phil: To me, the best feature is being able to record an animation on a disk and send it to a friend who can watch it without owning *Fantavision*. Video greeting cards are here to stay.



basic TRAINING

PROGRAMS FOR YOUR COMPUTER



ILLUSTRATIONS BY PHIL ANDERSON

Here Comes The Comet!

Apple, Atari, IBM

April is the last month you'll be able to see Halley's Comet without a telescope—until 2061, that is. But with this program, you'll be able to watch the path of a comet whenever you want.

The program traces the path of Comet Encke, a real comet that travels around the sun once every 40 months. The shape of its orbit is typical of many comets. Notice how the comet speeds up as it gets closer to the sun because of the sun's gravity. As the comet moves away from the sun, gravity slows it down until it starts its trip back.

This program was reprinted with permission from the book, *Science Computer Programs for Kids and Other People*, written by Tom Speitel, Mike Rook, Khan Pannel, Cornelia Anguay and Danny Speitel, published by Prentice-Hall, Inc.

Apple Comet

```

10 REM COMET
20 HOME
30 R=3.14:I=210:J=95
40 HGR: HCOLOR=3
50 HPLOT I,J-1 TO I,J+1
   TO I,J TO I-1,J TO I+1,J
60 FOR T=0 TO 40
70 VTAB (23): PRINT "MONTH ";T
80 X=100*COS(R)+140
90 Y=50*SIN(R)+95
100 HPLOT X,Y
110 D=(((X-I)^2)+((Y-J)^2))^.5
120 R=R+150/D^1.5
130 NEXT T
140 FOR D=1 TO 200: NEXT D
150 GOTO 20
    
```

```

75 PRINT CHR$(125)
80 PRINT "MONTH ";T
90 X=50*COS(R)+70
100 Y=25*SIN(R)+40
110 PLOT X,Y
120 D=(((X-I)^2)+((Y-J)^2))^.5
130 R=R+49/D^1.5
140 NEXT T
150 GOTO 40
    
```

IBM Comet

```

10 REM COMET
20 SCREEN 4
30 R=3.14:I=210:J=95
40 CLS
50 LINE (I,J-1)-(I,J+1)
60 LINE (I-1,J)-(I+1,J)
70 FOR T=1 TO 40
80 LOCATE 1,20: PRINT
   "MONTH ";T
90 X=100*COS(R)+140
100 Y=50*SIN(R)+95
110 PSET(X,Y)
120 D=(((X-I)^2)+((Y-J)^2))^.5
130 R=R+150/D^1.5
140 FOR G=1 TO 200: NEXT G
150 NEXT T
160 GOTO 40
    
```

Atari Comet

```

10 REM COMET
20 PRINT CHR$(125)
30 R=3.14:I=100:J=40
40 GRAPHICS 7: COLOR 2
50 PLOT I,J-1: DRAWTO I,J+1
60 PLOT I-1,J: DRAWTO I+1,J
65 FOR DE=1 TO 100: NEXT DE
70 FOR T=0 TO 40
    
```


Cat And Mouse

Commodore 64, 128

Who wouldn't want to build a better mousetrap? A mouse, of course! In this game program, you can be either a mouse or a cat. If you are the mouse, your goal is to get into the mousehole at the top of the screen. If you're the cat, the object is to catch the mouse.

Both players use the keyboard to move. The cat uses the A,W,S and Z keys. The mouse uses the K,O,L and the comma (,) keys.

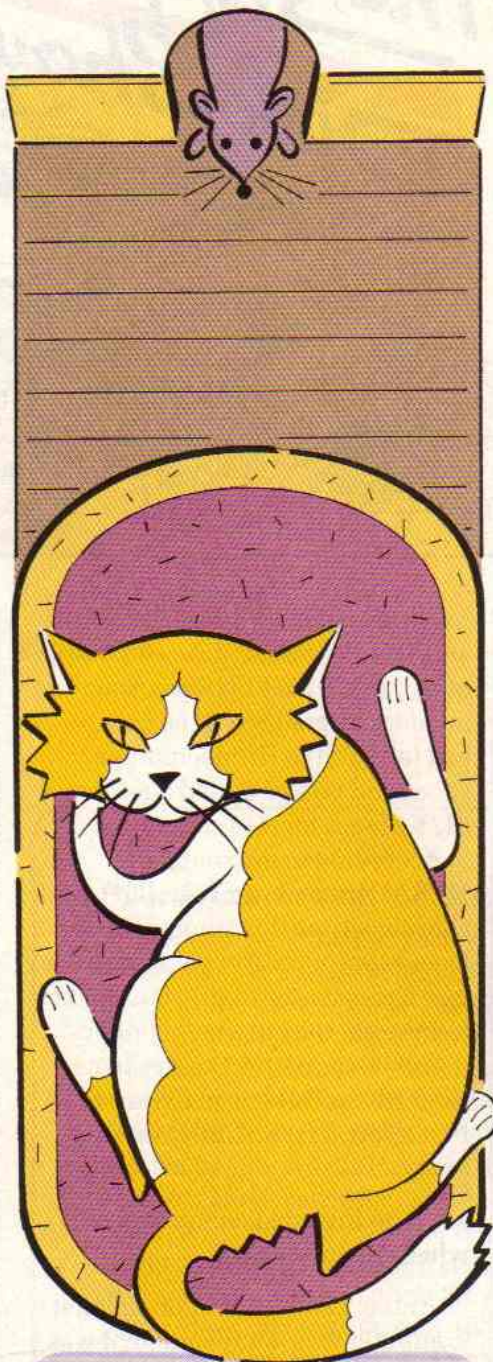
Peter Contreras, 14, of Sun Valley, California caught our attention with this program.

Commodore 64, 128

```

10 PRINT CHR$(147)
20 POKE 53281,1
30 PRINT "NAMES, PLEASE..."
40 INPUT "THE CAT-";C$
50 PRINT
60 INPUT "THE MOUSE";M$
70 PRINT
80 PRINT "PRESS ANY KEY TO BEGIN"
90 GET A$:IF A$="" THEN 90
100 PRINT CHR$(147)
110 C=1124:M=1924
120 POKE C,94:POKE M,42
130 POKE 1043,87
140 GET A$:IF A$="" THEN 140
150 IF A$="A" THEN POKE C,96:C=C-1:POKE C,94
160 IF A$="W" THEN POKE C,96:C=C-40:POKE C,94
170 IF A$="S" THEN POKE C,96:C=C+1:POKE C,94
180 IF A$="Z" THEN POKE C,96:C=C+40:POKE C,94
190 IF A$="K" THEN POKE M,96:M=M-1:POKE M,42
200 IF A$="O" THEN POKE M,96:M=M-40:POKE M,42
210 IF A$="L" THEN POKE M,96:M=M+1:POKE M,42
220 IF A$="," THEN POKE M,96:M=M+40:POKE M,42
230 IF M=1043 THEN 310
240 IF C=M THEN 320
250 IF C=1043 THEN C=C+40:POKE 1043,87:POKE C,94

```



```

260 IF M>1984 THEN POKE M,96:M=M-40:POKE M,42
270 IF C>1984 THEN POKE C,96:C=C-40:POKE C,94
280 IF M<1023 THEN POKE M,96:M=M+40:POKE M,42
290 IF C<1023 THEN POKE C,96:C=C+40:POKE C,94
300 GOTO 140
310 PRINT M$;" WINS!":GOTO 330
320 PRINT C$;" WINS!"
330 PRINT "PLAY AGAIN? Y/N"
340 FOR DE=1 TO 800:NEXT DE
350 GET A$:IF A$="" THEN 350
360 IF A$="Y" THEN 10

```

Name That Note!

TI 99 4/A

This program tests your ear for music. First, it will play four notes for you. Try and remember what they sound like. Then your computer will play the notes one at a time and ask you to name them. You answer by pressing keys 1 through 4. After each correct answer, the computer shortens the amount of time you can hear the note.

You can easily add more notes to this program.

TI 99 4/A

```

10 CALL CLEAR
20 D=3000
30 FOR N=1 TO 4
40 PRINT "HERE IS NOTE ";N
50 GOSUB 270
60 FOR DE=1 TO 1500
70 NEXT DE
80 PRINT
90 NEXT N
100 CALL CLEAR
110 D=1500
120 PRINT "WHAT NOTE IS THIS?"
130 N=INT(RND*4)+1
140 GOSUB 270
150 D=D-50
160 IF D<200 THEN 180
170 D=200
180 CALL KEY(0,K,S)
190 IF S=0 THEN 180
200 K=K-48
210 IF K=N THEN 120
220 PRINT "SORRY, THAT'S WRONG"
230 PRINT "PLAY AGAIN Y/N?"
240 INPUT A$
250 IF A$="Y" THEN 10
260 END
270 REM NOTES
280 ON N GOTO 290, 310, 330, 350
290 CALL SOUND(D, 262, 5)
300 GOTO 360
310 CALL SOUND(D, 294, 5)
320 GOTO 360
330 CALL SOUND(D, 330, 5)
340 GOTO 360
350 CALL SOUND(D, 349, 5)
360 RETURN

```


The Slipped Disk Show



ILLUSTRATION BY CAMERON EAGLE

Hi ho, hackers! This is Slipped Disk here, the floppy disk jockey, coming at you with a special April 1st edition of the Slipped Disk Show! Yes, it's time once again to answer your questions about computers, life, the universe, and how they get the figs into Fig Newtons.

Speaking of Fig Newtons, it's time for our first computer question. This one comes from **Johnny B. Goode** of Hopalong, Wyoming:

"What kind of home computer should I buy?"

Johnny, it's hard to pick a home computer. So my advice to you is—don't!

"But Slipped," you say, "how can I grow up to be a great computer expert like you if I don't have a computer?" Well kid, it turns out you don't need a computer. In fact, no one needs a computer anymore.

Yes, Johnny, computers will soon be replaced by an alien being that NASA has discovered on one of the moons of Jupiter. This creature is called the Hruneemumps and it has 512,000 fingers (256,000 on each hand) and a video screen instead of a head. By counting on its fingers, the Hruneemumps can do everything that a 512K computer can.

The Hruneemumps are very easy to take care of, since they live en-

tirely on a diet of Classic Coca-Cola and Wonder Bread. (Come to think of it, that's what I live on.) And memory upgrades will be cheap—just take off the Hruneemumps' shoes and you've added another 512K of toes for it to count on.

According to my sources at NASA, Hruneemumps will be available sometime this summer in selected computer and pet stores. And yes, Hruneemumps do play *Donkey Kong*, only they use real donkeys!

Our next question comes to us from **Annie Oaklee**, of Gedoudda-here, New Jersey. Annie wants to know:

"Who invented computers and when did they do it?"

Annie, believe it or not, the first computer was not invented, it was grown! It happened in 1921, when a farmer named Conrad Highburt found a 230-pound zucchini growing on his farm in East Long Branch Creek River Brook, Louisiana. He didn't know it at the time, but the zucchini was growing in the exact shape of a Commodore 64 with a disk drive and color monitor. Unfortunately, that same night, Mr. Highburt's wife, Zelda, made the zucchini into a very large quiche which went on to win a blue ribbon at the East Long Branch Creek River

Brook County Fair. However, the Highburts' twin sons, Ezekiel and Conrad, Jr., grew up to own the first video arcade laundromat pizza parlor in Mobile, Alabama.

Which somehow brings us to our final question, just in from **Carmen Casablanca**, of Honolulu, West Virginia. Carmen's question is:

"Will computers ever take over the world? And can you tell me when they will so I can stop cleaning my room?"

Carmen, I'm afraid it's too late, computers have *already* taken over the world. It happened last November 7 at 4:27 p.m. However, by 4:28 the computers got fed up with trying to understand people and gave control back to us. So go clean your room.

And that's all the room we have this month. Remember, if you have serious computer questions, send them to:

**The Slipped Disk Show
3-2-1 CONTACT
1 Lincoln Plaza
New York, N.Y. 10023**

See you next month, and happy April Fools!

Slipped Disk's vocabulary supplied by Richard Chevat in return for a promotional consideration.

Disappearing Acts

In October we asked you to tell us about an embarrassing moment when you wished you could have simply disappeared. Here are some of the best.

Struck on You

Last summer my mother and I were going to the store. We passed some men working on the sidewalk. I didn't see the wet cement sign and took about five steps. I had the whole street laughing at me. Even my mom was cracking up! I should have been on "Candid Camera."

Tracy Biscan, Louisville, KY

Messy Missy

One day when I was at the movies, I offered my day camp counselor some popcorn. But then I spilled my popcorn and cherry coke all over her. She said it was okay. We went back to camp and I spilled my glue on her. Then I really wanted to disappear! Ever since I have had a messy reputation.

Katie Rooney, McLean, VA

Locker Loser

I was in school and I went to open my locker and couldn't get it open. I kept trying, but it wouldn't open. Then this girl came up to me and said, "Why are you trying to open my locker?" That was embarrassing!

Jennifer Curo, Portage, IN

Mr. Potato Head

About two years ago, I was at a church dinner the Sunday before Thanksgiving. After I was finished filling my plate, I turned around to sit down. Just then a man with a mound of mashed potatoes on his plate walked behind me. When I turned around, I bumped into him and he swung around. The plate of mashed potatoes went right into my face!

Scott Sears, Snyder, TX

Holy Socks!

Last year I was wearing mismatched socks with holes in them. I wasn't aware of this until the man that was fitting my new shoes started laughing. Boy was I embarrassed then!

Brian Ellison, Southfield, MI

On Your Toes'

One night I was dancing in "The Nutcracker." While I was dancing, I flipped over and my hat fell off. I tripped over it, and there I was on the floor in front of hundreds of people!

Carrie Carpenter, Stormville, NY

Naptime

When I was 10, I went shopping

with my mom and sister. I was sitting in a store window and I fell asleep! I woke up and people were gathered around poking me. They were saying "Is she dead?" I was so embarrassed I wanted to die!!

Kari Boyers,

Austin, TX

A Little Elbow Grease

When I was seven and doing the dishes, my dad told me to use some elbow grease. Not knowing what it was, I looked for it in the cabinets, closets and everywhere else. Then I shouted, "Where is it? I can't find the elbow grease."

Then everybody started to laugh.

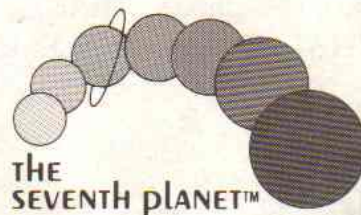
Katherine Hoffman,

Gainesville, FL

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Extra!

Welcome April with some EXTRA! fun and excitement.

Tiny Tech

Here's a word search of tiny inventions that have made our world more portable. The names go across, up, down and backwards. Find the words in CAPITAL letters. When you're done, the leftover letters will spell out the answer to this inventive riddle:

What did Benjamin Franklin say when he discovered electricity?

Word List:

BATTERIES	MICROCHIP
CALCULATOR	PORTABLE tv
CASSETTE player	STEREO headphones
CORDLESS phone	TRANSISTOR radio
DIGITAL watch	WALKMAN

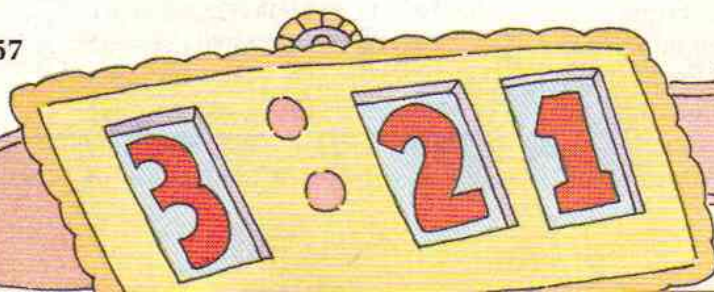
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M	N	O	B	T	E	H	I	W	O
I	N	G	A	P	T	C	A	A	T
C	U	S	T	O	T	L	E	L	A
R	H	E	T	R	E	A	W	K	L
O	E	R	E	T	S	T	A	M	U
C	S	T	R	A	S	I	O	A	C
H	O	S	I	B	A	G	H	N	L
I	O	C	E	L	C	I	K	E	A
P	D	S	S	E	L	D	R	O	C

ILLUSTRATIONS BY MICHAEL DONATO

CONTACT

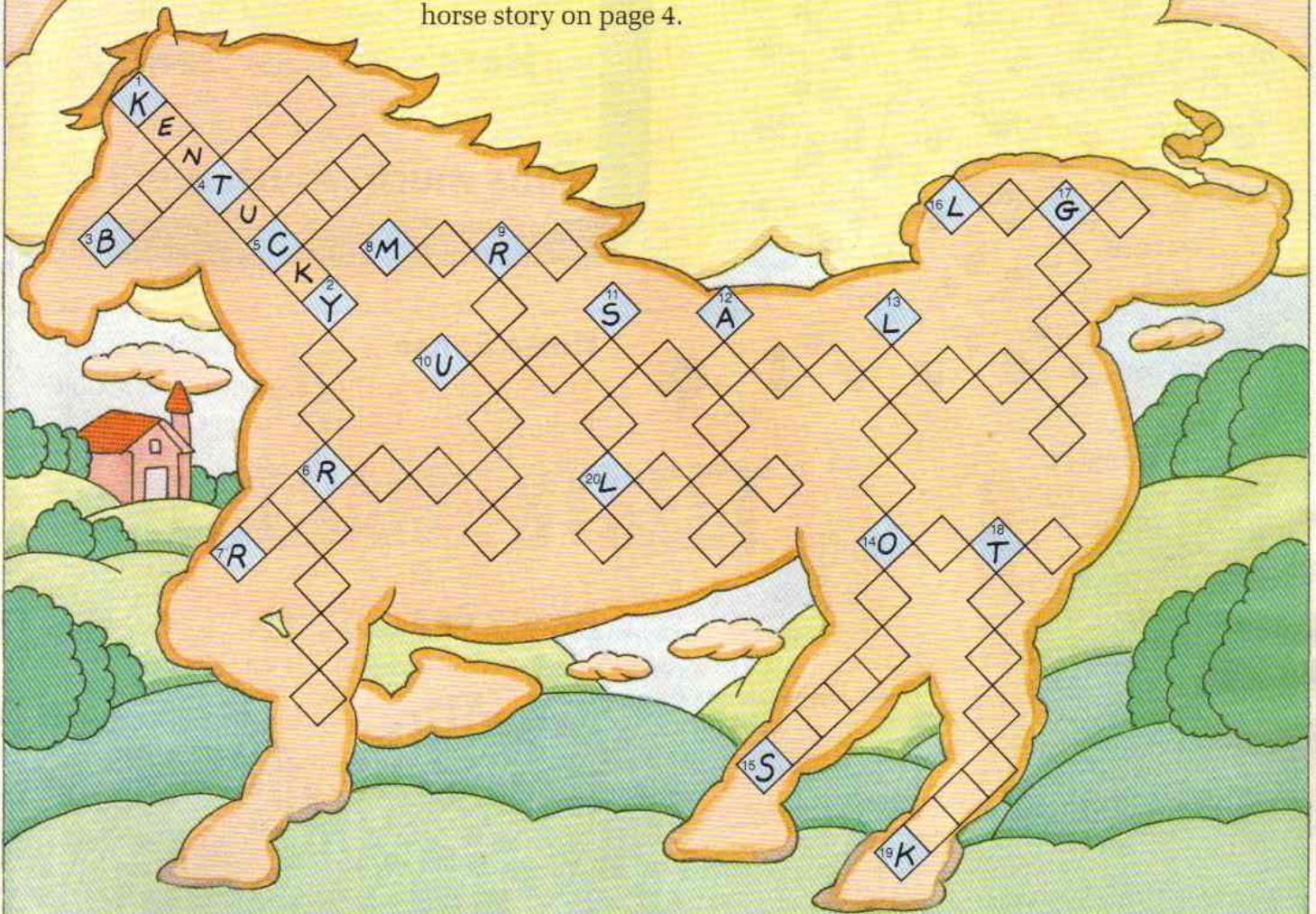
You've read all about what's hot in wrist technology. Now try your hand at inventing something tiny yet terrific ...something wacky that can fit right on your wrist. We'll choose our favorites. Winners will get CONTACT T-shirts. Send your drawings with descriptions to:

3-2-1 CONTACT
Tiny Tech
P.O. Box 599
Ridgefield, NJ 07657



Horse Sense

Try this crossword based on "horse sense." The words go up, down and across. The first letter of each word is written in the blue box. (We've done one to get you started.) For some clues, check out the wild horse story on page 4.

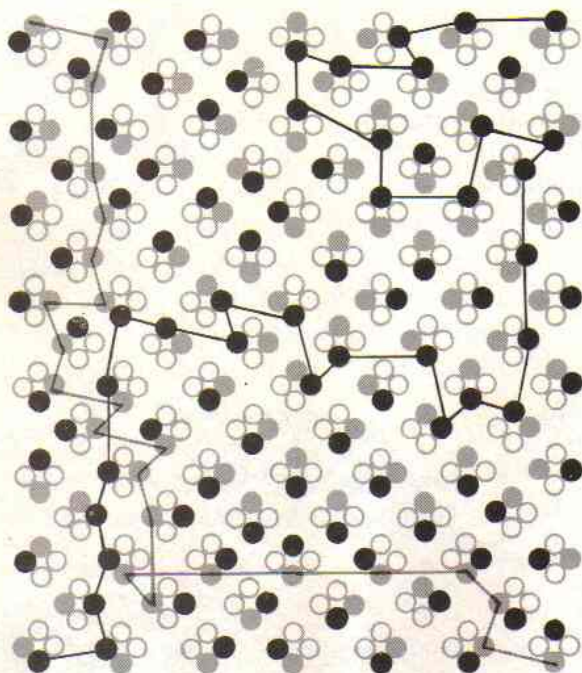


1. The _____ Derby is a famous horse race.
2. A one-year-old horse is a _____.
3. Most horses sleep in a _____.
4. A _____ is faster than a walk.
5. A young horse is a _____.
6. Lassoos are made of _____.
7. Sunshine liked to _____ up on her hind legs.
8. "On your _____, get set, go."
9. Horses roam on open land called _____.
10. Nevada is a state in the _____.
11. A _____ is usually found in a barn.
12. Sunshine is from the _____ -A-Horse program.
13. Cowboys rope horses with _____.
14. Horses eat _____ (rhymes with boats).
15. Most horses wear horse _____.
16. Wild horses have strong _____.
17. Sometimes horses graze on _____.
18. A horse can be taught to do a _____.
19. When Sunshine was caught she liked to _____.
20. Horse's gait (rhymes with hope).

Answers on the Did It! page.

Did It!

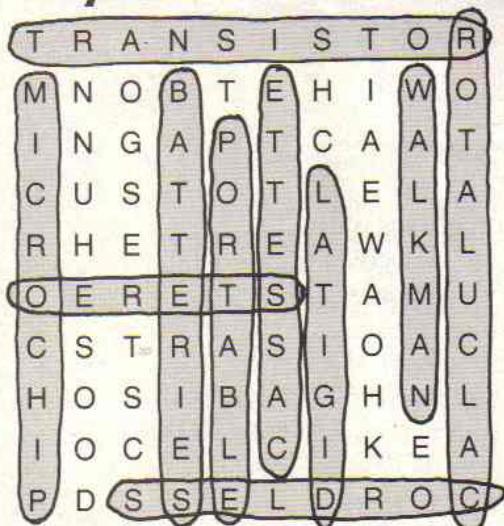
Dot Maze



Crazy Comics

6	2	5
8	4	7
3	1	9

Tiny Tech



Answer: NOTHING. 'CAUSE HE WAS TOO SHOCKED.

Next Month!

Here's a sneak peek at what you'll see next month in 3-2-1 CONTACT's Special Sports and Health Issue

Double Dutchers

Meet a group of sixth-grade champions who make jumping rope double the fun.

Here's to Your Health

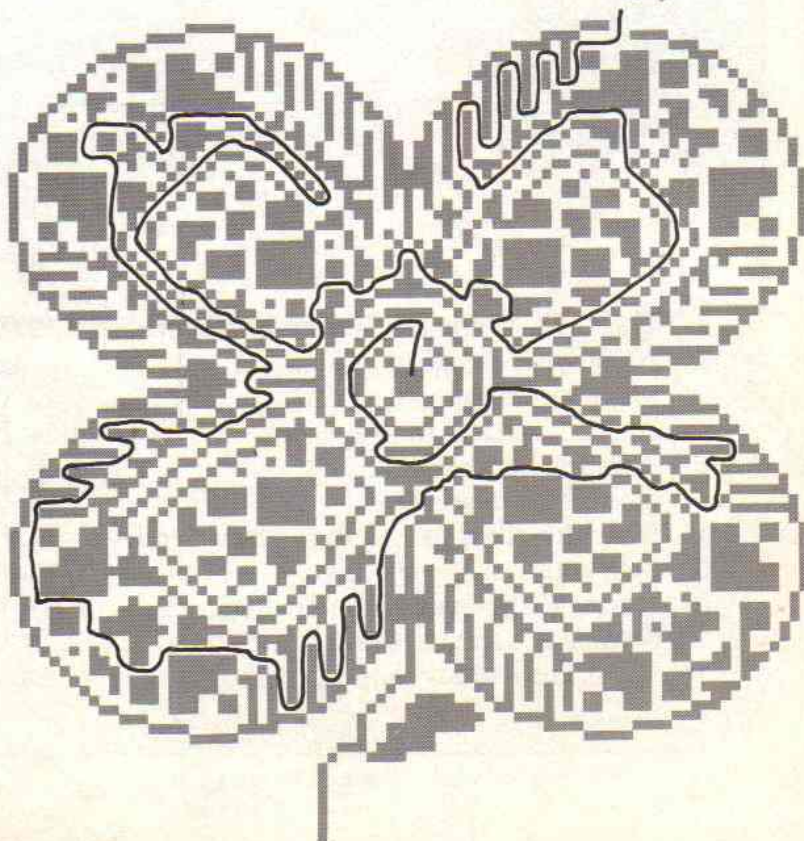
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5. Colt
6. Rope
7. Rear
8. Mark
9. Ranges
10. United States
11. Stall
12. Adopt
13. Lasso
14. Oats
15. Shoes
16. Legs
17. Grass
18. Trick
19. Kick
20. Lope

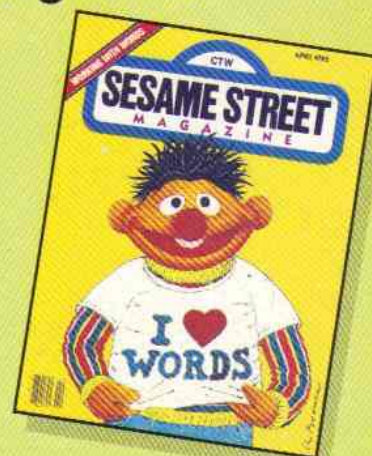
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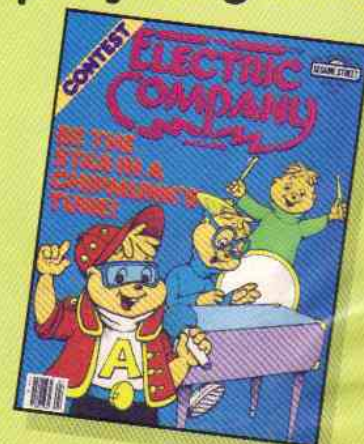
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